FLASHES AND PLUGS

WHAT'S HER NUMBER? A USITA convention guest asked a sweet young thing there for her telephone number and received the following answer:

"My number consists of three figures. This number will be greater by 99 if the figures are reversed completely. If you take away the figure at the left and place it to the far right, the number then will be greater by 189. Take the right hand figure and transpose it to the left, and the number will correspond to the original number as 4 to 3."

At last report, the guest was still scratching his head. Do any of our mathematics-minded readers want to try their luck?

• • •

HIGH-PRICED CALL. Carrier pigeon might have been cheaper, mused Donald Mingeon of Winooski, Vt., after paying $15.70 for a telephone call—without reaching his party. Mr. Mingeon unsuccessfully dropped 40 nickels in a pay-station telephone, then ran to the nearby telephone business office to get his money back. Refused, he acted in such a "belligerent" manner he was arrested. His fine plus costs totalled $13.70.

• • •

SWISS MRS. CAN'T MISS. In Switzerland, when a young bride is having trouble with a recipe, all she need do is dial No. "11" on her telephone and the government information service helps her out of her difficulty. This government information service is equipped to answer all types of questions, ranging from home-making and baby care to elaborate recipes. In fact, the agency has never been stumped for an answer to any type of question, it was reported.

When the young bride calls to find out about a recipe, the operator asks her a few pertinent questions and discovers just what food the bride is preparing, what she has done wrong and advises her what to do to correct her mistakes.

• • •

OPERATORS PLUG MOVIE. Advertising over the telephone is the new service being offered movie producers, distributors and exhibitors by Movietime, Inc., New York City, says *Printers' Ink*. Answering requests for showings at movie houses throughout the city was the company's initial function, but starting in October a motion picture producer for the first time used the company's complete service to promote a specific picture.

Sidney G. Alexander, eastern advertising and publicity director, Vanguard Films, Inc., announced that Movietime's telephone operators were instructed to add a tag line to all service replies from October 1 to December 31 to promote the movie company's forthcoming feature, *Duel in the Sun*. Julius Polinger, president, Movietime, Inc., said the messages will be short and punchy variations of "Watch for Duel in the Sun."

Rates for this service will be based on units of a thousand telephone messages. The present rate for distributors and exhibitors subscribing to Movietime's service is $1.00 per thousand messages.

The six-month-old company reports it has 22 telephone operators on duty covering the Metropolitan New York area and answering more than 100,000 inquiries a day. Mr. Polinger said his company recently added its first distributor, "The March of Time," to its client list, which heretofore has included only exhibitors. Inquiries to Movietime cover programs of a specific theater or about a particular movie, but information is not restricted to clients.

Movietime plugs its service with newspaper ads and in coming events trailers and programs of its theater clients.

TELEPHONY

The Journal of the Telephone Industry

OCTOBER 26, 1946

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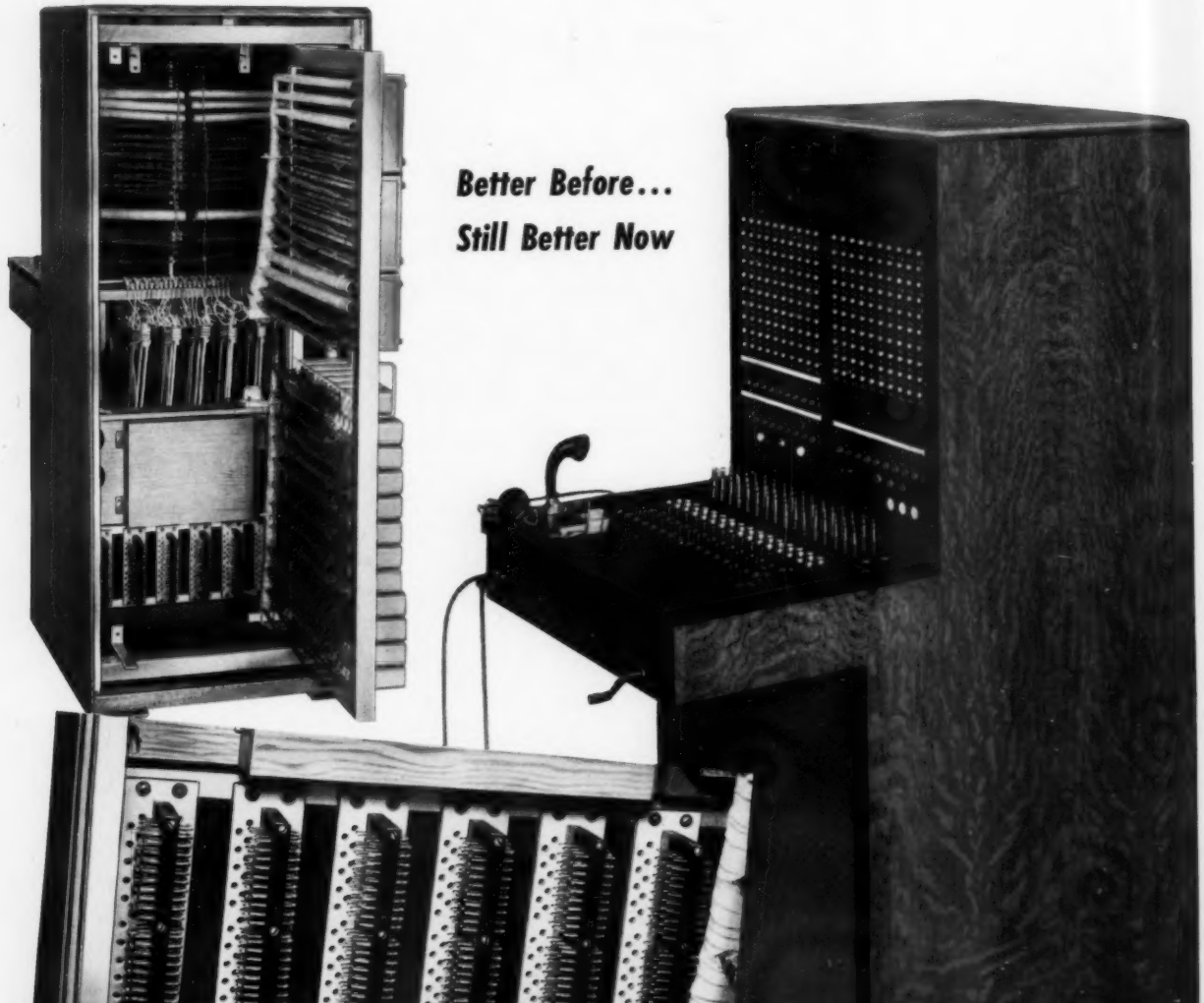


Better Before...
Still Better Now

Close-up showing new and improved wiring arrangement of Masterbuilt Junior, for still easier installation, testing and maintenance.

KELLOGG *Masterbuilt* JUNIOR

FOR FINER "BIG CITY" SERVICE IN THE SMALL COMMUNITY

Engineering Library

"MORE AND BETTER SERVICE"

Keynote of USITA *Convention*

By R. C. RENO

Independent telephone companies urged to improve and expand service to meet increased public demand. . . . Immediate need for increased rates if industry is to render better and adequate service topic of discussion by many speakers and outside of sessions. . . . Lumpkin elected president.

THE 1400 Independent telephone men and women who attended the annual convention of the United States Independent Telephone Association, October 14, 15 and 16 in Chicago, heard President W. C. Henry lay down, in a frank and forceful address opening the general sessions of the meeting, the challenge facing the Independent industry in meeting the demand for improved and expanded telephone service.

While this subject was more or less the theme of all sessions and conferences of the convention, Mr. Henry discussed the problem in "straight-from-the-shoulder" language, which should have a great influence in stepping up the industry's present accelerated activity in solving the telephone service situation.

Two immediate jobs facing the Independents, Mr. Henry said, are: (1) Satisfying all requests for local exchange service, and (2) effecting an adequate coverage of rural areas.

Filling requests for service is receiving the number one priority of practically every telephone company and, while the industry has done a good job in installing telephones in spite of shortages of equipment and manpower, still more effort must be exerted in that direction, he stated.

Again, in regard to the coverage of rural areas, Mr. Henry stated that great strides have been made in the past few years in expanding and improving rural telephone service, but he warned that it is necessary for the industry to redouble its efforts to serve every possible rural applicant for service.

As a long-range postwar responsibility facing the industry, Mr. Henry declared that the Independents in general must provide a vastly improved standard of telephone service, both as to quality and quantity. This, he said, is particularly true of many small companies, which, because of inadequate rates and income, have permitted their plants to become obsolete and inadequate. With an improved standard of service, he said, there must come a new standard or level of rates to cover all costs of providing modern service.

Mr. Henry's address, which presents a challenge to every Independent telephone company, is published in full on other pages of this issue.

This year's USITA convention was one of the best ever held as far as programs are concerned. The agenda for the general sessions and group conferences contained discussions on problems and matters of interest to both large and small companies. For this reason, the full texts of all but two of the addresses presented in the general sessions and conferences are published in this issue so that those who could not attend the meeting will have an opportunity to read and study them.

While the attendance at this year's convention was not up to previous years, it was considered good in view of the shortage of hotel facilities not only at the Stevens Hotel, but at all hotels in Chicago. Inability to get rooms undoubtedly kept many Independents from attending the convention.

Telephone manufacturers played an important part in the convention pro-

In accordance with its established policy and in response to the many requests made at last week's USITA convention, TELEPHONY again is pleased to publish in full practically all the addresses and committee reports presented at that meeting.

Always a challenge in that it presents a race against time, the task of compiling and publishing this convention issue has been particularly difficult because of the general overcrowding of printing and engraving facilities. That we have been able once more to fulfill what we believe to be our responsibility to the telephone industry is, in itself, a tribute to our printers, engravers and TELEPHONY's entire staff, whose united efforts bring these valuable reports and addresses to those who were not privileged to hear them.

R. A. LUMPKIN
President

V. E. CHANEY
First Vice President

OSCAR BURTON
Second Vice President

CLYDE S. BAILEY
Executive Vice President

CARL D. BROREIN
Treasurer

F. D. RIDINGS
Secretary and Assistant Treasurer

gram when the presidents of Automatic Electric Co., Kellogg Switchboard & Supply Co., North Electric Mfg. Co., and Stromberg-Carlson Co. took part in a panel discussion on "What the Manufacturers Are Doing to Help Meet the Service Situation." R. A. Phillips, Sioux Falls, was the moderator and a running report of the panel discussion appears on page 74.

Secretary F. D. Ridings in his annual report stated that there had been a substantial gain in the membership of the association and he asked the cooperation of state associations in keeping the roster of accredited member companies up-to-date. Companies having less than $50,000 annual gross revenues and which are members of state associations are eligible for accredited membership in the USITA.

In discussing the statistical volume containing selected data relating to the operations of 184 Class "A" and 49 Class "B" Independent telephone companies for the year 1945, which Secretary Ridings' office compiles, he presented information regarding the operations of those companies which should be of interest to both the industry and the public, stating:

A net increase of $21,043,000 was recorded in 1945 over 1944 in the total assets of Class "A" and "B" companies. Investment in telephone plant increased $10,777,000 and current assets approximately $7,500,000. The total plant investment of Class "A" and "B" companies on December 31, 1945 was $449,739,000.

In 1945 the Class "A" and "B" companies reported gross operating revenues totaling $135,494,000, an increase of $9,413,000 for the year. Of this amount $3,402,000 was in local service revenues and $5,499,000 in toll revenues.

Taxes and wage adjustments were the controlling factors in determining the owner's share of the increased gross revenue in 1945. The tax collector's direct cut of the net operating revenues was approximately 57.6 per cent or an increase of 1.2 per cent over 1944.

The tax collector claimed $1,437,000 of the $9,413,000 increase. The sum of $27,007,000 was paid out in direct taxes during 1944, while in 1945 this amount increased to $28,444,000.

The increase in operating expenses, other than taxes, required an additional $7,963,000. After payment of these increased expenses and taxes only *$13,000* of the $9,413,000 gross revenue increase remained.

The net amount available for payment of interest, dividends and fixed charges increased $68,000 in 1945 over the amount available for that purpose

New USITA Officers

President—R. A. LUMPKIN, Mattoon, Ill.
Executive Vice President—CLYDE S. BAILEY, Washington, D. C.
First Vice President — V. E. CHANEY, Chicago, Ill.
Second Vice President — OSCAR BURTON, Tyler, Tex.
Treasurer—CARL D. BROREIN, Tampa, Fla.
Secretary and Assistant Treasurer —F. D. RIDINGS, Washington, D. C.

at the close of 1944. This was brought about mainly by increases in non-operating revenues or by decreases in non-operating expenses. The total amount available for interest, dividends and fixed charges at the close of 1945 amounted to $21,287,000.

The largest increase in operating expenses was revealed in traffic expense which totaled $3,144,000. Increases in other operating expense accounts were as follows: Maintenance, $1,999,000; depreciation and amortization, $524,000; commercial, $1,021,000 and general and miscellaneous, $1,275,000.

Treasurer Carl D. Brorein, Tampa, Fla., reported the association to be in a healthy financial condition.

The USITA sponsored a luncheon meeting of state association executives on October 15, at which many subjects concerning association work and the problems confronting the industry were discussed.

The Independent Pioneer Telephone Association held its annual meeting on October 10, with President R. W. Siemund presiding. A full report of this meeting will be published in next week's issue.

One of the features at the convention was the demonstration of the use of power line carrier equipment by the American Telephone & Telegraph Co. This demonstration was well attended and many Independents were interested in this new method of rendering rural telephone service over existing power lines which is accomplished by carrier equipment.

Two of the principle addresses of the convention were given by Dr. Emerson P. Schmidt, Washington, D. C., director, Economic Research Department, Chamber of Commerce of the United States, and Gordon Volkenant, Minneapolis, research engineer, Minneapolis-Honeywell Regulator Co.

Mr. Schmidt spoke on "The Economic Problems Ahead" and his address will be published in a future issue of TELEPHONY.

Mr. Volkenant, speaking on "Electronics—the Magic of War and Peace," explained, in non-technical terms, the development of the vacuum tube and its use in designing many of the automatic controls used in bombers and other aircraft during the war and which will be used extensively in many peacetime products.

The convention re-elected the following directors: W. M. Angle, Rochester, N. Y.; F. S. Barnes, Rock Hill, S. C.; A. O. Black, Butler, Pa.; F. E. Bohn, Fort Wayne, Ind.; J. P. Boylan, Rochester, N. Y.; H. V. Bozell, New York City; C. D. Brorein, Tampa, Fla.; Oscar Burton, Tyler, Tex.; V. E. Chaney, Chicago, Ill.; Walter Dakin, Madison, Wis.; Ray Dalton, Everett, Wash.; H. M. Engh, Erie, Pa.; A. L. Hart, Abilene, Kan.; W. C. Henry, Bellevue, Ohio; C. D. Manning, Chicago, Ill.; C. F. Mason, Santa Monica, Calif.; F. B. McHenry, Jefferson City, Mo.; D. M. Mong, Newton, Ia.; R. E. Shotts, Chicago, Ill.; R. W. Siemund, Chicago, Ill.; R. B. Still, Bloomington, Ill., and Samuel Tucker, Pleasanton, Kan.

The following new directors were elected: Warren B. Clay, Hutchinson, Minn.; C. S. Cadwell, Chicago, Ill.; and H. E. Hageman, Lorain, Ohio. L. W. Hill, Tarboro, N. C., was appointed a director by the board to fill the unexpired term of J. R. Porter, also of Tarboro, resigned.

Other directors of the association are: J. H. Agee, Lincoln, Neb.; E. M. Blakeslee, Lafayette, Ind.; B. L. Fisher, Martinsville, Va.; A. N. Johns, San Francisco, Calif.; R. A. Lumpkin, Mattoon, Ill.; F. R. McBerty, Galion, Ohio; Kelley McNish, Bristol, Tenn.; R. A. Phillips, Sioux Falls, S. D.; R. E. Williams, Chicago, Ill., and John H. Wright, Jamestown, N. Y.

The directors elected the following officers: President R. A. Lumpkin, Mattoon, Ill.; first vice president, V. E. Chaney, Chicago, Ill.; second vice president, Oscar Burton, Tyler, Tex.; executive vice president, Clyde S. Bailey, Washington, D. C.; treasurer, C. D. Brorein, Tampa, Fla., and secretary and assistant treasurer, F. D. Ridings.

Members of the new Executive Committee of the national association are: Mr. Lumpkin, chairman; Mr. Agee, Mr. Angle, Mr. Barnes, Mr. Bohn, Mr. Cadwell, Mr. Engh, Mr. Henry, Mr. Johns, Mr. McBerty, and Mr. Phillips.

New Directors

C. S. CADWELL, Chicago, Ill.
WARREN B. CLAY, Hutchinson, Minn.
H. E. HAGEMAN, Lorain, Ohio.
L. W. HILL, Tarboro, N. C.

Executive Committee

R. A. LUMPKIN, Mattoon, Ill., Chairman.
J. H. AGEE, Lincoln, Neb.
W. M. ANGLE, Rochester, N. Y.
F. S. BARNES, Rock Hill, S. C.
F. E. BOHN, Fort Wayne, Ind.
C. S. CADWELL, Chicago, Ill.
H. M. ENGH, Erie, Pa.
W. C. HENRY, Bellevue, Ohio.
A. N. JOHNS, San Francisco, Calif.
F. R. McBERTY, Galion, Ohio.
R. A. PHILLIPS, Sioux Falls, S. D.

The board of directors, at its two meetings, discussed and considered many matters and took action on several items of interest to the industry.

A design for a proposed new association insigne to replace the present shield was considered by the board and it decided to continue the use of the present emblem. The executive committee had instructed the association's Advertising Committee to prepare and present the proposed insigne.

The board also recommended that the association, through its Tax Committee, make an effort at the next session of Congress to obtain repeal of the excise taxes on telephone calls. The present tax rates, of 15 per cent on local service and 25 per cent on long distance service, were imposed by the 1943 Revenue Act. Under existing law they will revert to the 1942 level of 10 per cent and 20 per cent, respectively, six months after the end of the war as proclaimed by the President or declared by Congress.

It will be the aim to have the excise taxes repealed in their entirety instead of merely stepping them down to their former level.

The board pointed out that telephone service is a business and social necessity and such service should not for tax purposes be ranked with such things as cigars, liquor, jewelry, country club dues and fur coats.

The directors also instructed the association's officers to arrange to have a representative at the October 23 hearing of the Georgia Public Service Commission, which is conducting a general state-wide investigation of telephone service.

The dates for the 1947 Spring Executives' Conference and 1947 annual convention were set by the board. The spring conference will be held April 14 and 15 at the Edgewater Beach Hotel, Chicago, and the annual convention is scheduled for October 14, 15 and 16 at the Stevens Hotel, Chicago.

Applications for active memberships

There was an early rush to register at the USITA convention as Pioneer banquet tickets were distributed on the basis of "first come, first served." Evidence of the congestion at the registration desks the first day is shown in these three photographs.

in the USITA were approved by the board for the following companies: Kamas Woodland Telephone Co., Kamas, Utah; Ekalaka Telephone Co., Ekalaka, Mont.; Standard Telephone Co., Cornelia, Ga.; Chester Telephone Exchange, Chester, Mont.; Oak Ridge Telephone Co., Oak Ridge, La.; Saltillo Telephone Co., Saltillo, Miss.; Big Timber Home Telephone Co., Big Timber, Mont.; Fairview Telephone Co., Fairview, Utah; Merigold Telephone Co., Merigold, Miss.; Mona Short Line Telephone Co., Sundance, Wyo.; Eagle Valley Telephone Co., Eagle, Colo.; Kansas State Telephone Co., Baxter Springs, Kan.; Farmers Union Telephone Co., Sussex, N. J.; West Side Telephone Co., Morgantown, W. Va.; Avoyelles Telephone Co., Kinder, La.; Jeff Davis Telephone Co., Prentiss, Miss.; Decatur Telephone Co., Decatur, Miss.; Glen Allan Telephone Co., Glen Allan, Miss.; Harrison Telephone Exchange, Harrison, Mont.; Sunburst Telephone Co., Sunburst, Mont.; South Pennsylvania Telephone Co., Waynesburg, Pa.; Western Illinois Telephone Co., Sioux Falls, S. D.; Sumter Telephone Co., Sumter, S. C.; Porto Rico Telephone Co., San Juan, Puerto Rico; Federal Telephone & Radio Corp., Nutley, N. J.; Whitney Blake Co., New Haven, Conn., and Homelite Corp., Port Chester, N. Y.

President-elect Lumpkin announced the appointment of the following chairmen of the association's committees for the ensuing year: *Accounting*, Ranford Dunlap, Chicago, Ill.; *Advertising*, C. C. Pearce, Riceville, Ia.; *Bell Acquisitions*, R. A. Phillips, Sioux Falls, S. D.; *Commercial*, R. B. Still, Bloomington, Ill.; *Dial Interexchange*, F. E. Norris, Santa Monica, Calif.; *Employment Relations*, J. H. Agee; *Membership*, B. L. Fisher, Martinsville, Va.; *Plant*, L. W. Hill, Tarboro, N. C.; *Rural Telephone Service*, W. C. Henry; *Tax*, H. V. Bozell, New York City; *Toll Compensation and Settlements*, E. M. Blakeslee, Lafayette, Ind.; *Traffic*, W. A. Kern, Rochester, N. Y., and *By-Laws*, R. A. Phillips, Sioux Falls, S. D.

As in past years, we are not publishing a long running story of the USITA convention, but instead all of the addresses presented at the meeting (with the exception of the ones by Dr. Emerson P. Schmidt and Gordon Volkenant) are being published on the pages that follow.

Bulb Shortage Can't Stop Cameraman Blain

TELEPHONY extends thanks to Ray Blain, its technical editor, for his cooperation in presenting a pictorial record of last week's USITA convention.

Mr. Blain was handicapped by a nationwide flash bulb and film shortage, which produced some pictures that fell somewhat short of his usual high standards. Also, there were no manufacturers' exhibits, which serve generally as a gathering place for telephone people and an ideal spot for group "shots."

We feel that TELEPHONY'S technical editor has done a splendid job despite the difficulties which might have daunted a less persevering cameraman.

R. A. LUMPKIN, Mattoon, Ill., USITA president-elect (left), and R. A. PHILLIPS, Sioux Falls, S. D.

WALTER DAKIN, Madison, Wis., newly-elected president of the Independent Pioneer association (left), and F. D. RIDINGS, USITA secretary.

OUR POSTWAR RESPONSIBILITY

By W. C. HENRY
USITA President

THE officers of your association and your board of directors are gratified, as we are sure you are, that after a lapse of two years we again are permitted to meet in this manner. Our annual conventions are valuable institutions. They not only provide us with refresher courses and keep our thinking on a current basis, but they bring us periodically in touch with our friends in the telephone industry. This part of our conventions has a deeper meaning to us with each passing year. Friendship breeds faith—faith in ourselves; faith in our business. It is this faith in the future which has made our communication system one of the most splendid examples of foresight, ingenuity and leadership the world has ever seen.

In ancient Greece, when people had problems they consulted the Delphic Oracle for advice. Life then was easy. Today the complexities of the present business world make other approaches necessary. This is a time of intense specialization. We are specialists in the art of communication, experts in the art of speeding the messages of mankind. Not all of us, however, are specialists in every branch of that art, and it is because of this fact, among other considerations, that we hold an annual convention such as this. It is the magnet that brings us together for the purpose of focusing with different eyes upon the same problem, in the interest of assuring the adoption of the soundest solutions. . . .

This is a dynamic industry in which you and I labor. It is going to continue that way. Ever since a Scotsman, Alexander Graham Bell, invented the telephone, just a little more than 70 years ago, there have been three outstanding rules which have dominated the minds of telephone people. The first *is to go forward.* The second *is to go forward.* And the third *is to go ever forward.* Progress always has been our controlling force.

What about this Independent industry of ours? What were the conditions and circumstances that gave it impetus? An understanding of the background is necessary to intelligent analysis of our responsibilities lying ahead.

The development and growth of the Independent telephone industry may be traced through several fairly definite and well-defined periods. Following the expiration of the original basic telephone patents in 1894, factories for the manufacture of Independent telephone equipment were started.

The owners of these factories, in order to create a market for their products, promoted the organization of telephone companies. Many of these Independent companies were in cities and towns where Bell plants also were in operation. The public welcomed this competition, as a means of controlling rates and practices, as well as stimulating the growth and development of telephone service.

The desire for local telephone service

W. C. HENRY

spread rapidly and plants were built in thousands of small communities. Farmers were encouraged to organize mutual companies, or to build rural lines connecting with switchboards owned by commercial companies. Competition for local telephone business created competition for toll business between communities and the period of duplication was on.

For a space of 20 years there was an intense struggle between the two groups in the industry. In this period our Independent group was forged in the furnace of competition, and emerged to establish its right as a vital segment in providing telephone service to a very substantial part of the total area of this country. Happily, this first cycle ended in December, 1913.

There followed the second era in our industry, which was a period of substantial development and growth of thousands of Independent telephone companies and the widespread expansion of rural lines into the areas around these local exchange offices. From 1913 to 1919 duplication of telephone exchanges largely was eliminated through purchase and sale of approximately an equal number of stations. In the following two years the purchase by the Bell System of several large Independent companies was disturbing, but this practice was discontinued, and the issue was resolved during the year 1922.

In this period following 1913, the Independent industry outgrew its knee britches and became of age, with a strong organization of Independent manufacturers aiding in its progress. The larger operating telephone companies also definitely became conscious of two necessary factors in our business, the need for a depreciation reserve and the necessity for adequate rates for service. The telephone business was recognized by the public as being a safe, conservative business in which to invest their savings, and the commercial companies secured adequate permanent financing, generally within their own communities.

An increase in the number of toll lines and the necessity for the improvement in transmission required working arrangements between connecting telephone companies, but in this second period each exchange, or each company of several exchanges, was, to a very large extent, a separate entity within its own operating territory, and its primary interest and responsibility was local in character.

Following World War I, some of our larger and more progressive operating units embarked upon extensive programs for extending their facilities and improving the quality of their service. With each succeeding year, more companies recognized the desirability of replacing their telephone exchanges with an improved type of central office equipment and subscribers' station apparatus. World War II, with its restrictions on our domestic economy in order to meet an international threat, brought an abrupt end to almost all additions and betterments in our business for a period of four years. The termination of military operations 14 months ago marks the end of the second cycle in our industry. It places every Independent operating telephone company abruptly and squarely face to face with postwar responsibilities and obligations which are nationwide in their character and their implications.

Group of state association executives taken before their annual luncheon meeting which is sponsored by USITA.

Four years of war accelerated by several times that number the normal demands of the people of this country for telephone service, both as to the volume of local exchange and long distance service, as well as the quality and character of that service. Telephone service has assumed a new high level of essentiality in our present day business and social economy. In the last five years, toll traffic has more than doubled, and local calling rates have increased almost that much. Telephone usage has become so universal, and so large a percentage of our patrons have traveled about the country, and are continuing to conduct their business outside their local exchange areas, that the local character of any single telephone company's service has been to a large degree superseded by the larger requirements and service standards of a nationwide communications service.

What are the most important problems just ahead of us? The Independent telephone industry faces two immediate obligations, and in addition a longer range fundamental responsibility which must be met over the next several years. The satisfaction of all requests for local exchange service and adequate coverage of our rural territory are the two immediate jobs to be done.

The first one—that of installing all held orders at the earliest possible moment — has been receiving number one priority from practically every telephone executive.

We are only too familiar with the fact that almost every material essential to telephone construction is in short supply. Lead requirements are only about one-third of the demands for this metal and the manufacture of telephone cable has been curtailed severely. Available supplies of copper are scarcely more than half the tonnage needed for the electrical, automobile, telephone construction and other industries. Strikes have restricted production all along the line, and the shortage of manpower and the decrease in worker efficiency increases, rather than improves. During the war, our manufacturers utilized their factories almost exclusively for military requirements, and when VJ-day arrived, were required to start almost from scratch in the uphill task of providing the necessary materials with which to manufacture telephone instruments and equipment. Theirs has been the most difficult task of trying, at the same time, to satisfy a four-year's accumulation of normal requirements, and an unprecedented demand for additional service.

In the face of all these conditions, our industry is, almost without exception, doing its utmost to install at least party line telephone service to those who ordered service prior to this current year. The tremendous unexpressed demand for new service, which became apparent when restrictions on the installation of telephones was released, has added to the back-log of orders, and materially increased the size of this objective. Telephone companies, generally, are doing everything they can to satisfy local exchange service requests. At the same time they are experiencing, and will continue to be confronted with, their most critical public relations problem in keeping their communities fully apprised of their efforts to render service at the earliest possible moment to all who want it. Telephone instruments now are in better supply, but in many communities where additions to central office equipment, or extensions and outside plant increases are required, it will be the end of next year before all applications can be translated into completed service orders.

The second most immediate problem of our industry is that of providing adequate rural telephone coverage. There has been more consideration given to this particular problem in the last two years than to any other single issue in our industry. Although the rural telephone bills introduced in the last session of Congress were not even assigned for hearings before House or Senate committees, there is little doubt that legislation to create a Rural Telephone Authority, or to increase the authority and funds of REA, to permit that federal agency to enter the telephone field, will be re-introduced in the 80th session of Congress within a few days after it convenes next January.

Far too many Independent telephone companies have failed fully to realize the potentialities of this legislation. I call your attention to the fact that the rural telephone bills, which were introduced in the last session of Congress, provided that a federal agency could build lines and furnish service in villages and cities up to 10,000 population in size. The enactment of such legislation would be a constant threat to the large majority of Independent exchanges, since the construction of rural telephone lines in the area around a village or city up to 10,000 population means an exchange of 2,500 or more stations. The next step very easily could be action to take over the telephone exchange and its service in the village or city.

Action in the next session of Congress on legislation to place a federal government agency in direct competition with the telephone industry, which has grown to its present status over almost three-fourths of a century as a private enterprise, will be influenced largely by the aggressiveness of our industry, both Bell and Independent, in providing rural telephone service. You all have seen the advance estimates of the Bureau of the Census, which indicate that the number of farms having telephones increased by 300,000 in the five years from 1940 to 1945, even though the total number of farms in the United States decreased in number during this period by about 200,000 farms.

But what is the industry doing in 1946? When the associated Bell companies announced last fall that they would add 1,000,000 new rural stations in their territory within the following three to five years, it seemed like a most ambitious objective. But in the first nine months of this year the Bell System has added 259,980 of these stations, and by the end of the year they expect the increase in telephones in rural areas served by them to exceed 330,000 stations. That will represent a gain by the Bell System companies of 33 per cent in their number of rural subscribers within the 12 months of 1946. It represents an outstanding achievement in rural telephone development.

Information which our association has been able to secure from our state association executives and from some of our large operating companies indi-

cates that the gain in rural stations this year in Independent territory will be approximately 110,000 stations. That would amount to a gain of almost 8 per cent in rural telephones, which is some two times our normal rural growth. The best and most convincing argument against the necessity for a federal agency to provide rural telephone service is for us to provide the required service ourselves. Independent companies will make substantial progress this year in serving their rural territory, but there remains much yet to be done, and I urge upon you the necessity for re-doubling your efforts to serve every possible rural applicant in your exchange areas.

Newly-elected USITA officers (left to right): President R. A. LUMPKIN, Vice Presidents V. E. CHANEY and OSCAR BURTON, and NANCY BOND, of the USITA Washington headquarters office.

Now what do I mean when I refer to our longer range postwar responsibility? The Independent industry faces, in the period ahead, the necessity of providing a vastly improved standard of telephone service, both as to quality and amount. It is no longer an acceptable answer to explain away the character of our telephone service by proclaiming proudly that we are operating Independent telephone companies. The standard of living of the great mass of laboring people and farmers in this country has been raised tremendously, and the increased importance of communications in the new tempo of everyday business activity, requires that every Independent operating company be a unit in a satisfactory overall national communications system, insofar as service is concerned. The standard is set by the other group in our industry, and it is by this standard that the public will judge the telephone service which we render in the Independent field.

Over the last several years the proportion of exchange individual line service has been decreased greatly, and the fill on party lines has been increased to very near their maximum capacity. This has resulted in downgrading of local exchange service. Large amounts of capital will be required to increase central office equipment and outside cable, wire and other plant facilities, in order to restore the prewar standard of telephone service. A higher proportion of individual lines should be provided in order to improve our exchange service and to facilitate the termination of long distance traffic.

Left to right: MRS. D. T. STRICKLAND, Brownwood, Tex.; A. N. JOHNS, San Francisco, Calif., and MRS. JOHNS.

Local calling rates have in many places almost doubled, and a corresponding increase in local exchange trunking equipment to eliminate busies is required.

In the last 25 years, the volume of long distance traffic has quadrupled, and in the last five years it has more than doubled. In the years immediately ahead the increased earnings of a large part of the public, and the new basis on which everyday business activity is conducted, indicate that the present volume of toll traffic will continue to increase. We in the Independent industry must provide toll lines and toll switchboard equipment sufficient to handle a further increase of from 20 to 30 per cent in long distance traffic over the next five years, with more than 90 per cent of the calls completed on a CLR basis.

The standard of living of the inhabitants of the small villages and rural sections of this country has been raised tremendously during the last decade. These people have automobiles, tractors, airplanes, electric lights, refrigerators and radios, and they want modern, up-to-date, and thoroughly reliable telephone service. Furthermore, they have the money with which to pay for the cost of modern telephone service. I know the reliability and transmission advantages of the faithful old magneto telephone, but like the old horsehair sofa, it is not old enough to be of value as an antique, and it is too far out of date to be wanted around anymore. And the old multicode, gang ringing, rural line with 15 or more parties belongs to the age of the big threshing rings and the community husking bees—an age that has passed into history. Modern rural metallic line telephone service, with not more than 10 subscribers on a line and selective ringing, will be required. I believe that in the next few years an increasing number of our operating companies are going to find it desirable to offer four or five-party selective ringing rural service, at a proper rate and under tariff restrictions as to the minimum number on a line.

We must provide a higher standard of central office, outside plant and subscribers station maintenance and reliability. In short, we must raise the entire standard of Independent company telephone service in general.

Such a goal cannot be achieved unless the service of our Class C and D companies is raised immensely and it is these companies which by the

large, are least able to undertake and carry through the necessary service improvements. Out of a total of some 6,200 separate operating telephone companies, which make up the Independent group, more than 5,900 are Class C and D, or are mutual or farmer line companies. In far too many cases, their principal owners have other business interests of greater importance. Hundreds of these smaller units are financed inadequately and are existing on service rates which are too low to permit them to discharge their responsibility by providing proper service in their exchange areas. Many more are too small to afford fully competent management or adequate operating and maintenance personnel. This is not a criticism of a large part of our industry. It is, I believe, a statement of fact which must be recognized and dealt with under changed conditions which face the industry in this postwar period.

We must come face to face with the problems which arise from the very number of small units in our branch of the telephone industry. And we should be bold enough in dealing with this matter not to stand in a neutral corner. The problem cannot be solved by an attitude of neutrality. We must reconcile ourselves to a new concept of the kind of public service to which our subscribers are entitled.

There is a parallel to this problem in another public utility enterprise. There are cold, logical and fundamental reasons why the Independent telephone industry is most likely to follow the pattern of the private electric light and power industry. Edison established the celebrated Pearl Street electric generating station in New York City as a pioneer venture in private enterprise in 1882. In the years that followed, the number of private electric utilities increased by leaps until they reached a peak of 4,224 in 1917. Since that year the number has declined steadily, and the Federal Power Commission directory for 1941 lists 1,150 privately owned electric utilities. And this smaller number of companies serve a total of almost three times as many customers in an increasing number of municipalities. There can be no doubt but that with the increase in size of individual units, the quality of electric service has improved.

The small Independent rural telephone companies all over this country have for more than a half of a century provided telephone service in areas which would not have otherwise had the advantages of service. Nothing but sincere praise and credit can be given for their courageous record of pioneering in the formative period of

ELINOR BISHOP of the Telephone Advertising Institute and W. W. SHOOP, Vandergrift, Pa.

our industry, but from now forward the operation of these small rural companies under changed economic conditions, is an uphill fight which will become increasingly difficult. In order to secure adequate capital at a reasonable rate of interest for large scale plant improvements and extensions which are required; in order to have the advantages of proper engineering, technical, supervisory and management personnel; and in order to secure, equip and train efficient operating and maintenance employes, it is my belief that within the next 10 years more than half of our present Class C, D, and smaller telephone companies must of necessity disappear as separate local companies.

These small telephone companies either must join together with a number of other small companies to form an efficient telephone operating unit of sufficient size to be able to afford competent management and justify the employment of trained maintenance employes, or they must be taken over by, or be merged with, some larger Independent operating company.

There are steps which some small companies are taking to avoid this. A control office contract, on a reasonable payment basis for the control office services, offers to many single office companies the opportunity of installing modern dial exchange service on an unattended basis. With adequate local rates, those companies which follow this course can provide satisfactory service and continue as solvent small operating units. Also, an enlarged local area of service is going to be required by the subscribers of a great many smaller exchanges, and the subscribers will pay the cost necessary to make such service available to them. Small exchanges located at the edge of larger cities will be subjected to increasing pressure for service to the larger exchange.

In these cases, a wider area of local service must be provided, and it can be made possible in many instances, on an equitable basis, to both the owners of the smaller exchange and their subscribers. Contracts generally can be negotiated with the larger company to provide interchange of local service with the smaller exchange, at a reasonable fee per month for each subscriber of the smaller company. On this basis the outlying telephone company can secure the same exchange rates as the city exchange to which it makes service available. The increase in revenue and the additional subscribers which will be secured will more than carry the expense of providing sufficient inter-office trunks.

Our smaller exchange companies must find ways to provide their subscribers with the type of service which meets their needs best, and of course service rates must reflect the cost of this service.

Furthermore, if the smaller companies in our group fail to take the steps necessary definitely to raise their present standard of service, a considerable number of these companies will be subjected to the reaction of aroused communities which will in a short time get out of hand and make these companies distress situations. The past history of almost everyone of these situations is that pressure from the public and state regulatory bodies has resulted in the associated Bell telephone company in the area taking them over. The trend already is apparent in this first postwar year, and it will be accelerated in succeeding years.

Following the E. K. Hall Memorandum, the two large groups in the telephone industry have reiterated many times their belief in the desirability of maintaining two strong groups. Since 1929, there has been little attrition from the strength of the Independent group in number of telephones purchased. However, the period ahead with its requirement for raising the standard of Independent exchange service, and the consolidation of operating territories, requires that an equitable and practical method be agreed upon between the Bell System and the Independent group for the transfer through purchase and sale of logical exchange areas.

Such a plan is not easy, and there are many factors involved, but if the desire to achieve it exists, in the interest of raising the level of telephone service nationally, as well as maintaining the relative strength of our two groups, such an equitable plan can and will be worked out. The transfer of ownership of exchange territory would require purchase and sale negotiations on a fair and reasonable basis

(Please turn to page 84)

THE USITA ON THE FIRING LINE

By CLYDE S. BAILEY
USITA Executive Vice President

THE 24 months which have elapsed since we last met in convention assembled have been filled with events of breath-taking moment. You who are engaged in the magic art of speeding the messages of mankind have been doing a mighty important job, along with people in other essential industries, since we last met here in Chicago in 1944.

In the absence of a convention in 1945 your officers and your committees prepared reports which the association distributed by mail last October to every association member. In the address which our 1945 president, John P. Boylan of Rochester, N. Y., wrote for silent delivery, he stated that the trilogy of epoch-making events in that year alone—the unconditional surrender of Japan, the unconditional surrender of Germany, and the first practical application of atomic energy—was the most important link in the chain of history since the birth of Christ. As Mr. Boylan said, in comparison with those events everything else seems to sink into nothingness.

Most of us during the war thought that if only our foreign enemies could be licked, the rest would be sweet milk and honey and we shortly would experience the joy of finding the promised land. But life does not come that easy. The aftermath of the war is bringing its pains too, in the form of shortages of goods and equipment, and material with which to make goods and equipment.

While a flood of the things we need seems to be just around the corner, the last few miles to satisfaction of our needs is strewn with obstacles and bottlenecks.

The telephone service problem is more difficult of solution today than it has ever been before. . . . The public in some way should be made to understand, however, that telephone companies are not greater than the government which they help to support. They are subordinate to government, and ought to be. During the war the government told us in no uncertain terms that we could not go in for reconversion from manual to dial operation and that we could not get any other kind of new switchboard while the fighting was going on. It was a policy necessary for the successful prosecution of the war. . . .

Perhaps the reason the public finds it difficult to understand our problem is that, as a public utility, a telephone company is under a mandate of law of the sovereign state in which it operates, continuously to provide adequate and efficient service. That is a mandate for which telephone companies have the utmost respect.

But at the same time it is a mandate which must bow to the superior necessities of a nation at war.

I have no desire to give these particular remarks an international flavor, but I cannot resist pointing out that one of the reasons there is a shortage of supplies and equipment in this country is that the United States is committed to the policy of getting the devastated lands of Europe back on their feet. . . . Outright gifts to those unhappy countries, however meritorious from the standpoint of our international relations, have a definite bearing upon shortages being suffered in the good old United States.

Another thing. No one can compute the unestimated inconvenience caused to the American people by the strikes which have been conducted in various basic industries in this country during the past 18 months. Those strikes, most of which seem so senseless to the layman, have had repercussions along the line, the telephone line not excepted. . . .

Your association has been on the "firing line." . . . Its firing line has been in Washington where the interests of the Independent telephone industry have been given expression before government departments and committees of Congress. Its firing line has also been in Chicago and wherever else your association officers and committees have met for the purpose of advancing your cause. . . .

I can make only passing reference to the National Wage Stabilization Board, successor to the National War Labor Board, of which a part was the National Telephone Commission on which R. A. Phillips and, later, L. F. Shepherd served as principal representatives of the Independent industry. I can pause only a moment in referring to the Signal Corps of the Army, to the Bureau of Naval Communications, to the Coast Guard, and to the National Labor Relations Board. We have maintained contact with all of these agencies and have furnished information and help from time to time as called for. We have also had dealings with the Census Bureau, with the Rural Electrification Administration, with the War Assets Administration and with other governmental agencies from time to time as the interests of Independent telephone companies have required.

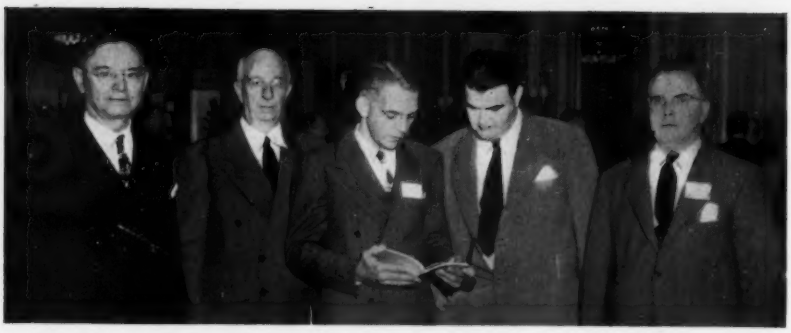
We have conferred frequently with officials of the Wage & Hour Division of the Department of Labor concerning problems confronting individual companies as well as those involving the Independent industry as a whole.

At the Federal Communications Commission your association has seen fit to intervene in several formal proceedings for the purpose of seeing that the interests of Independent telephone companies were given proper recognition. In the radio frequency allocation case, for example, your association engaged the services of a consulting engineer to present evidence in support of the allocation to the telephone industry of certain frequencies for various types of communication service.

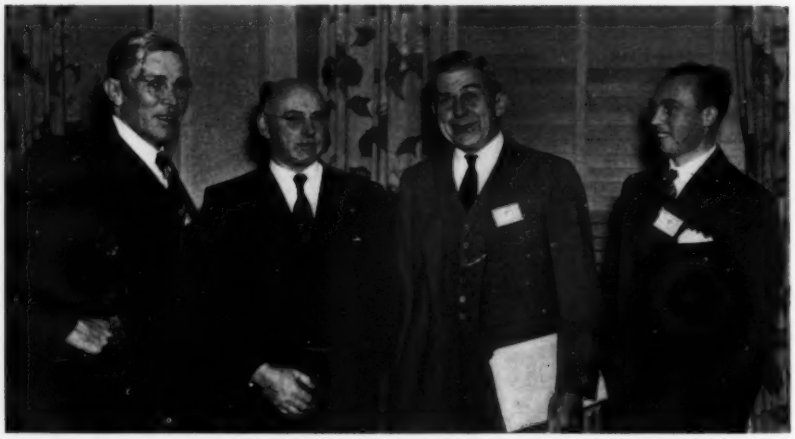
In a brief filed later, we urged upon the commission the view that the buses and trucks and other semi-public institutions that were joining in the scramble for frequencies, should be required to stay in their own backyard. We argued that frequencies to help make communication service more universally available at reasonable rates and without discrimination should be allocated to telephone companies which were in the communication business and had the know-how to a degree that could not be possessed by non-communication enterprises. The Bell System, of course, was before the commission, too, taking an exceedingly active part.

The commission granted certain frequencies to the industry with which we presume you are already familiar from reading the industry journals and the member letters sent out from association headquarters. Later, when inroads into these frequencies were proposed by certain radio interests, your association through its counsel appeared before the commission again and protested successfully. . . .

Your association also is represented in another radio case which still is pending. I refer to the application of the National Bus Communications, Inc., a subsidiary of the National Associa-



Left to right: J. W. WOPAT, International Telephone & Telegraph Co.; H. J. ENGLISH, general plant manager, Brazilian Telephone Co., Sao Paulo, Brazil, S. A.; J. HARTWELL JONES and N. M. SHENK, both of Tampa, Fla., and J. B. HALEY, Austin, Tex.



Left to right: V. E. CODE, Topeka, Kan.; LON JESTER, Rockford, Ill.; H. M. ENGH, Erie, Pa., and HAROLD JESTER, Leich Sales Corp.

tion of Motor Bus Operators, for the assignment to it exclusively of various frequencies now allocated on a shared basis, in order to enable the bus organization to provide radio-telephone service to, from and between buses operating over the public highways. The commission decided, for reasons stated in its report, that the buses should have exclusive use of frequencies for this purpose, but it expressly left for a later hearing the question as to the particular frequencies which should be allowed.

Your association has been gathering data from member companies to show the extent to which our Independent companies are availing themselves of frequencies heretofore granted on a shared or unshared basis to the telephone industry, and at the proper time this evidence will be introduced before the commission in the hope that it will, together with Bell System evidence, cause the commission to go with exceeding slowness in granting the buses an exclusive franchise on frequencies which the telephone industry regards as necessary to provide radio-telephone service on a common carrier basis. . . .

Another FCC proceeding in which we have interested ourselves is the sound recording case. In this proceeding, last January Vice President McHugh of the AT&T and President Henry of our association, appearing as witnesses for the respective branches of the telephone industry, advised the commission that freedom of speech and intimacy and secrecy of telephone communication were at stake in any proposal looking toward the indiscriminate use of voice recording devices.

The view was urged upon the commission that the unfettered use of those devices would constitute a deterrent to the normal use of the telephone. Both the Bell System and our association filed briefs in this case, and after a proposed report was issued, exceptions were also filed. The proposed report recommended adoption of the view that there is a real commercial demand for recording devices and that with certain safeguards the secrecy of telephone conversation will not be disturbed.

The safeguards mentioned in the proposed report would consist of an automatic warning device that would be repeated at regular intervals during the course of a telephone conversation, supplemented by a listing plan contemplating the placing of an asterisk in the telephone directory along side the names of subscribers who have recording instruments. The proposed report also stated that no recording devices should be used unless physically connected with the telephone line, and that equipment necessary to make physical connection, aside from the apparatus itself, should be installed and maintained by telephone companies.

In our exceptions to those recommendations we advised the commission that no automatic tone warning device of any character has yet been sufficiently perfected adequately to apprise the telephone user of the presence of recording equipment, and we also stated that the use of an asterisk or other special indicator in the telephone directory would likewise miss the mark of providing sufficient notice. . . .

In the field of legislation your association has also been active.

If it is true that your association was unsuccessful in its efforts to obtain enactment of a given piece of legislation which was regarded as helpful to industry, it is also true that legislation which was deemed harmful to the industry likewise failed of enactment.

Although one of the important services performed by such an organization as this is to watch legislative developments, the promotion or defeat of legislation is not its principal purpose. In view of this fact it is not necessary, in the opinion of informed people, for your association or any of its officers to register under the Federal Regulation of Lobbying Act passed at the last session of Congress. It is only when "the principal purpose" of an organization is that of seeking to promote or to defeat legislation that the registration and reporting requirements of the act apply.

The most important piece of legislation in Congress at the last session consisted of the nine or 10 minimum wage bills on which hearings were held both in the House and in the Senate. Working in close touch with our Employment Relations Committee, I appeared before the House Labor Committee last fall and Secretary Crowley of the Minnesota Telephone Association, chairman of our Wage-Hour Subcommittee, appeared before the Senate committee. The Pepper Bill, after a stormy fight, got through the Senate last April, but the Norton Bill, although finally clearing the House in July, got bottled up in the Rules Committee and never reached the House floor before Congress adjourned for the summer without bringing to the point of enactment any minimum wage legislation.

A coalition of Southern Democrats and Northern Republicans succeeded in so bludgeoning the legislation while in passage in the Senate that it was called a legislative monstrosity and a cadaver

by its very proponents as it went on its way to the House.

This legislation stands high on the administration's so-called "must" list. It is certain to be reintroduced at the session which opens January 3 and pressed for early consideration. . . .

The Gwynne Statute of Limitations Bill, requiring wage suits under the Fair Labor Standards Act to be brought within two years, advanced to passage both by the House and by the Senate. But victory was snatched away at the 11th hour, on the eve of adjournment, because of a legislative log jam which denuded Congressman Gwynne of an opportunity to ask House concurrence in certain amendments which the Senate had tacked on.

This meritorious legislation will be reintroduced at the next session, when your association and other trade organizations and employer groups interested in it will have to do their work all over again. . . .

Another bill that came to the point of a hearing, on the Senate side, was the Bailey-Hays Bill, the declared purpose of which is to develop the underdeveloped areas of the nation by providing technical aid of various kinds through three of the executive departments. With the general thesis of the bill our Independent telephone companies would doubtless take no exception. We would like to see the underdeveloped areas industrialized in any proper way. But back on page seven of

Left to right: E. W. MILLER and F. M. PARSONS, both of Kellogg Switchboard & Supply Co.; ROY AMMEL, Elyria, Ohio; DR. G. H. BRODY and J. G. BECKLEY.

Left to right: D. L. BAXTER, W. DINSMORE and GEORGE MORSE, all of Reliable Electric Co.; R. O. HOFFMAN, Stromberg Carlson Co., and J. B. COOK, Reliable Electric Co.

the bill is a provision calling for an investigation of the rates of every common carrier and public utility in the country, to be made jointly by the secretaries of commerce, labor and agriculture. They would be required to make findings and recommendations to Congress as to what should be done about rates found to interfere with rural development.

Although it is probable that the proponents of this legislation are interested primarily in electric power and transportation rates, the proposed investigatory authority would, in the absence of any exception clause, include the rates even of Independent telephone companies. If the investigation is ever made, the three cabinet members would probably be surprised to find that many of our Independent rates have been in effect for 15, 20, or 25 years. What public interest would be served in investigating rates which are on such an obviously low level?

To call for a cabinet investigation of rates of any form of utility enterprise smacks of a congressional declaration of lack of confidence in the federal and state regulatory agencies of the country which have regulated those rates for many years. . . .

This Bailey-Hays Bill will undoubtedly be reintroduced and urged upon the favorable attention of Congress by the do-gooders at the next session. . . .

The rural telephone bills got next to nowhere at the last session. They did not even advance to the point of a single hearing before a committee of either the House or the Senate. Let us hope that the industry will do such a first class job of dealing with the rural telephone problem that even in the most radical places there will be no urge to advance this legislation to passage.

The board of directors of your association has adopted the official view that the industry itself will be able to take care of the farm telephone problem as soon as materials and manpower are available. . . .

Your association has continued its policy of maintaining close liaison with the state telephone associations, and has lent its cooperation to them in a number of ways. The warm cooperation it has received in return has given your officers and board of directors a great deal of satisfaction. . . .

The fine work which our industry journals have done justifies the praise which is heard from time to time of their editors. The magazines are constantly seeking ways to improve their service to the industry. We commend them for what they have done, and at the same time urge every Independent company in the country to support them by the subscription method. Reading the magazines pays dividends.

Our relations with the Bell System have been marked by an attitude of mutual respect and cooperativeness. To the extent that there has been any conflict of interest it has been possible to resolve it satisfactorily around the conference table. . . .

As you are aware, the principal provisions of Order U-2, originally issued by the War Production Board and at the present time administered in skeletonized form by the Civilian Production Administration, now relate principally to the sequence in which different classes of people desiring telephone service shall have their orders filled. How much longer this order will be continued in effect remains to be seen. There is a disposition to wind up the affairs of the CPA entirely, early next year, and to allow it to go out of existence. Coincident with this there is a disposition to get rid of all outstanding limitation orders which had their origin in wartime necessity. . . .

(Please turn to page 84)

TAI IS AT YOUR SERVICE

By LEON F. ROBERTS

Chairman

USITA Advertising Committee

FOR FOUR long years, we in the telephone business have been coasting. For four smug years we haven't been able to make a costly mistake. No matter what we did, eager buyers fought until they were black and blue for our telephones and for our telephone equipment. Telephone users still pick up their receivers and call long distance as casually as they used to call the corner grocer. Toll revenues have increased accordingly. We have been, and still are, flooded with new applications for local service. . . .

I said that we have been coasting. Well, the time has arrived when we must drag the toboggan back up the hill. We cannot depend upon gravity from here on in. Let us face the fact that right now the Independent telephone industry is confronted with many drastic changes that will have to be met if many of us are to survive in our future economy.

One of the trade publications recently said editorially:

"We fear that some of the Independent telephone companies are being lulled into a false sense of security because their present gross revenues are higher than they have ever been before. They have held orders on hand, they are receiving applications for telephones at a rate never before experienced, and their toll revenues are unprecedentedly high. That is all very well for the present, but how long will it last?"

None of us is sure how long it will last, but the advertising committee of your association knows how it can help you make it last, and if it doesn't last in its entirety, we feel certain we can point to a way which will help to retain some of it, at least. That is what the committee wants me to tell you about, briefly.

On the theory, and it is a fallacious one, we think that they have had nothing to sell. Commercial staffs in many cases have been dispensing advertising and sales promotion funds with eye-dropper extravagance, forgetting that telephone companies always have service to sell. We believe the time has come to change that.

At the Illinois Telephone Association's convention in Peoria, one of its officials said:

". . . The telephone man is a student. He is service-minded first, engineering-minded second and sales-minded last.

"He will discuss enthusiastically for hours some complex path of a minute current going over a series of complicated construction, but when it comes to new ways of guiding a customer's mind to purchase his product at a profitable price, the glamour fades out.

"Advertising, sales promotion and sales plans are a sort of remote headache to him. He subconsciously knows such things ought to be thought about someday, but right now to him there are more important things, at least more interesting things, to do. So he works at those things he likes best."

This observation is a sage one and is given substance by a writer in an industry magazine who is impressed by the constant emphasis that is placed on the sales phase of the power business. One wonders, he says, whether or not the telephone field should not be similarly aggressive in an effort to sell telephone service and in an effort to get a larger share of the consumer's dollar. We are thinking, of course, in terms of normal times, but normal times, so-called, may be on us sooner than we think.

L. F. ROBERTS

In normal times, some companies *periodically* conduct sales campaigns to sell extension telephones, main line service, additional trunks, etc. But shouldn't we be *constantly* and *everlastingly* making a determined effort to get our subscribers to use more and better telephone service?

When a subscriber comes in to pay his bill, do we point out to him new ways in which a telephone more profitably can be utilized? Do we stress the saving in time and improvement in disposition that results from the upstairs extension? Do we present our subscribers with a neat and eye-diverting folder showing typical long distance rates from our exchange to other cities in the United States? Does a subscriber know, for example, that he can talk to New York from the middle of the United States for as little as $1.50?

The moral of all this is: Let us become more sales and service minded. By that we mean: Let us set up a regular program to tell our subscribers how they can derive greater benefits from their telephone service. Let's convince them that the days of universal service are here and that they can talk to anyone, any place, any time, at an unbelievably low cost. Let's hold our wartime toll traffic peaks. Let's not allow our subscribers to slide back to the state of mind in which the long distance telephone is used only for emergency purposes.

Through the medium of advertising, let us inform our subscribers, our employes, our stockholders and, yes, our regulatory bodies, of the need for adequate rates. Until we can get more equipment, let us tell the public why there are shortages and what we mean to do about them. Let us bear in mind that a well-informed public is the telephone industry's greatest security. Let us remember that public confidence *constantly* must be sought and *continuously* maintained. Let us remember that public relations is not a program or a promotion. It is a way of life. Through advertising we can enhance its value greatly.

Many people, and apparently some persons in official capacities, still believe that a 25-cent monthly increase in a $1.50 telephone rate is the road to luxury for the average telephone company. Indeed, in some states, there have been suggested rates of depreciation that would keep a specific model of telephone instrument in a subscriber's home long after many other items in the home had been replaced many times.

Now this is not, fundamentally, the fault of the great group of sincere regulatory employes upon whom public fear and suspicion of monopoly placed the responsibility of regulating our industry. *The fault is our own.* We have not been set up to tell the public the simple and honest truth about our complicated and unusual business. We have been mute when we should have been

frank. We have been unsympathetic and unresourceful alibiers in our commercial offices, when we should have been uniformly sympathetic and honest salesmen, or at least alert and honest counter-propagandists.

We now are beginning to realize that the Independent telephone industry has a story to tell and that the time has come when we must tell that story to our regulatory commissions, to our state and national legislators, to our subscribers, to our investors and prospective investors, and to the telephone-using public.

At last we have a medium through which we can tell our story, tell it well and tell it economically. Nearly 950 exchanges all over this country, in Hawaii, Alaska and Canada now are using this medium. I refer to the Telephone Advertising Institute. And here's *its* story—

In recognition of the longfelt need for an Independent telephone co-operative advertising service, there was established early in 1944 by your national association, under the leadership of R. A. Phillips, past president of the association, the Telephone Advertising Institute, which for more than two years now has been supplying advertising, publicity and public relations material to Independent companies at an astonishingly low rate.

As chairman of the advertising committee, which has directed the Institute and its affairs these past two years, I am happy to report that the Telephone Advertising Institute now is a firmly established, financially sound, vigorously constituted and thorough-going concern. A deficit of $5,000, which was advanced by the ever-helpful agency supplying our material, has been wiped out. As the result of a promotional fund, made available by USITA's directors, the Institute has been represented at nearly all state association conventions, and with gratifying results.

At regular intervals, subscribers to the Institute receive a package containing timely, colorful and effective material, professionally produced by a nationally known advertising agency, in the form of newspaper advertisements in a variety of sizes, posters, booth cards, counter cards, press releases, radio announcements, and the informative Telephone Advertising Digest, official publication of the Institute and clearing house of Independent telephony ideas.

Because the material is created on a mass production basis, the cost of the service is so low that even the smallest company easily can afford this modern and up-to-date, streamlined, tailor-made advertising service. If large companies were to produce their own comparable material, it would cost them at least three times as much, and if the smaller companies were to produce their own comparable material, it would cost them at least 10 times more than it now costs to subscribe to the Advertising Institute. For example, any exchange serving less than 1,000 stations can obtain the service for $1.50 per month, or $18 per year. Just think of it!

In order to have mass production, you have to have sustained mass demand. That is why we urge all of you who have not yet subscribed to the institute to investigate its possibilities at once. The institute needs you, and we believe you will need its service more and more as time goes on. The more subscribers we receive, the better we can make the service and the better our chances of keeping our subscription rates at their present economical level. This is becoming increasingly difficult because of rapidly-rising production costs which, like everything else in these days of inflationary trends, are mounting alarmingly.

This National Telephone Supply Co. trio is (left to right): G. E. VOYLES, C. H. KLEIN and JOHN E. WINCHESTER.

Left to right: ROY WELLER, Weller Mfg. Co.; STAN SHERMAN, L. L. RUGGLES, both of Automatic Electric; G. L. PETITGOUT, Philadelphia, and A. W. MacRAE, also of Automatic Electric.

I invite your attention to the display of advertising material near the entrance of this assembly room, and to its custodian, Elinor Bishop, the efficient and hard-working executive secretary of the institute, who will be glad to explain the service to you in detail.

This report is subscribed to by the other members of the Advertising Committee, namely: Verne B. Clark, Pekin, Ill.; J. Hartwell Jones, Tampa, Fla.; Frank D. McCarthy, Erie, Pa.; Clifford C. Pearce, Riceville, Iowa; Carl Spaid, Kansas City, Mo., and R. C. Reno, Chicago, Ill. Great credit is due them for the success of the advertising program. Each has done an outstanding job in behalf of our industry. I am proud to have been associated with them. They have met the challenge of their assignment. They now join me in thanking you for your help; they join me in soliciting your further good will and cooperation, and they join me in saying to you: The future success of the Telephone Advertising Institute and its continued ability to serve our industry will, from this day forward, be dependent upon the support it receives from the executives of Independent telephone companies.

SOLVING THE RURAL PROBLEM

By R. A. LUMPKIN
Chairman
USITA Rural Service Committee

ONLY recently there have been released from Washington certain figures from the latest U. S. Census of Agriculture for 1945. These figures, while still in the form of an estimate, verify what students of the farm telephone problem have known for a long time, namely, some real industry-wide progress is being made in extending telephone service in rural areas.

These census figures conform closely to previous industry estimates and disclose an increase in the ratio of farms with telephones to all farms from 25 per cent in 1940 to 32 per cent in 1945. Reviewing the census figures and observing the amount of growth shown, one of the keenest analysts of industry problems has said, "When we consider that this impressive gain was made in the face of material and manpower shortages, during a period almost entirely taken up by our national war effort, there is basis for a certain amount of self-congratulation on the part of the telephone industry."

If we agree with this statement, and we can be fairly certain that most of us do, then there is also basis for at least an equal amount of self-congratulation over what has been accomplished in the year and two months following VJ-day. The manpower problem has lessened to a certain degree, but womanpower is also a primary factor in any telephone company's operations and in many instances there is a greater shortage here than at any time during the war. As for material, the supply of many needed items which readily were available under a wartime priorities system, appears to have dried up completely while the near future offers only the smallest promise of delivery.

Nevertheless, rural station gains have accelerated substantially in 1946. The Bell System alone reports an increase of 260,000 farm telephones for the first nine months of this year, more than twice that system's increase for all of 1945. Independent company figures indicate a gain of about 100,000 rural telephones for the 12 months ended June 30, 1946, while the number of orders for rural service held on that date was almost double the number held a year before.

Therefore, despite the gains in new farm telephones, there seems to be a continuing demand for more and more rural telephone service. The industry recognizes a nationwide need for more service in rural areas. It also recognizes a need for improvement in the type of service that has been rendered in the past. The industry proposes to fulfill both needs as rapidly as possible.

It has been suggested that at various times in the history of the industry, rural development has occupied a position somewhat less than foremost in plans for the extension of telephone service. But it has been pointed out clearly before that the real key to farm telephone development is to be found in the amount of farm income received. And in general, farm installations have kept pace with the greater demand created by the increase in farm income. Just as farm income is presently at its all time peak, so is the number of farm telephone installations being made from month to month. State by state, moreover, farm telephones follow a ratio closely paralleling per capita farm income. A tabulation of War Savings Bond sales released by the U. S. Treasury Department particularly is interesting to students of the rural telephone problem. A list of the states arranged in accordance with farm telephone development offers a striking similarity to a list of states arranged in accordance with bond sales. And both such lists conform to a third list—states arranged in accordance with farm income per capita. Thus, it would seem to be apparent that low farm income offers the same resistance to the sale of government bonds that it does to the sale of farm telephones.

But for the present at least, and certainly so long as farm income remains relatively close to its present levels, the telephone industry's merchandise is meeting up with little if any sales resistance in rural areas. Insofar as rural telephone service is concerned, we seem to have been plumped down into the midst of a seller's market. This gives rise to a new and perhaps the most serious of all problems associated with rural telephone service. How can we best avoid that unhappy circumstance which usually accompanies every seller's market—namely, not enough merchandise to go around.

For despite the recent gains there are, of course, thousands of families in rural areas now waiting for service. In fact, there are some areas in which this number is more than double the number of a year ago. Many of them have waited tolerantly during the war years, recognizing the inability of the industry to obtain materials needed for line extensions required to serve them. But with industry again able to turn its attention to peacetime activities, new radios, refrigerators and even automobiles are making their appearance in the market in ever-increasing quantities. Along with other commodities, farm families now expect

LEFT PHOTO: Representing National Carbon Co. at the convention were C. C. LENINGER (left) and E. F. SCHULZ. RIGHT PHOTO: W. C. STREHL, Suttle Equipment Co. (left), and A. J. STULTS, TELEPHONY.

telephone service to become available at an increasing pace.

The need of more and improved rural telephone service is receiving the attention of farm leaders and agricultural organizations in every section of the United States. These people look to the industry for prompt and vigorous action. Recognizing what already has been accomplished, they expect even more for the future. They have confidence in the industry's ability to provide the service which they are requesting.

The manner in which the telephone industry has met its rural responsibilities over the past several months has slackened attempts at federal intervention through the creation of an agency such as the proposed Rural Telephone Administration. But federal intervention is not always motivated solely by the need for something that cannot be provided otherwise. More than once in the past, our American system of free enterprise has been the real target of those zealous individuals who would have the government take over. It seems safe to predict that there will be attempts to revive federal intervention in the rural telephone field, if not along the same lines as in the past, then surely in accordance with the dreams of some new crusader, but the blueprints will bear a striking similarity to those we have seen before.

Admittedly, much of the progress to date has been made by using up central office margins, increasing line fills, adding wire on existing poles and making short extensions. But the possibilities afforded by these methods have been exhausted largely in respect to the telephone plant of 1945. The going has been getting tougher every day.

This Kellogg group includes (left to right): C. E. BROWN, T. R. SCHWEER, A. B. POGUE, E. R. SEARS and BILL KIMMEL.

It seems needless to point out that for most companies which neither have initiated substantial additions to plant nor have made plans for an early undertaking of such work, the end of the road is clearly in sight.

Practically all telephone companies have adopted rural programs. More and more of them aggressively are pushing all phases of their programs placing particular emphasis on five principal activities.

First, every effort is being made to clear up held applications and meanwhile meet other urgent needs for service.

Second, plant additions are being engineered and built adequately to meet the large demand for service expected in the next three to five years.

Third, every possible attention is being given to clearing up any particularly undesirable service conditions which may have developed during the war years as a result of material and manpower shortages.

Fourth, tariffs are being reviewed and revised in order that they may conform to the objectives of the rural program.

And *finally,* the public is being kept well informed of the progress being made and the plans that the industry has under way for rural expansion.

The provision of service for those who already have applied for it is of primary importance in every rural telephone program. Therefore, first efforts are being directed toward clearing held orders while meantime attempting to meet other urgent needs for service. This, of course, is essentially the philosophy of original government regulations such as the long to be remembered War Production Board Order U-2. A like order still in effect continues to assure the public that telephone facilities will be allocated as rapidly as they become available, first on the basis of essential needs of the customer and thereafter in strict accordance with the age of the customer's application.

The present volume of held orders not only will exhaust remaining plant margins, but will require the addition of much pole line, wire and central office equipment. These additions must be planned, keeping in mind the necessity of not only meeting adequately the large demand for service that is expected in the next three to five years, but, in addition, normal margins must be restored in all parts of the plant. In order to facilitate the extension of rural service, more and more use is being made of new methods designed to provide every possible economy in construction costs. Included in these methods is the use of long span high-strength steel wire construction, the building of lines across private right-of-way, the joint use of long span rural power lines, and more and more in the not too distant future, carrier equipment using

L. P. RAND, Chester, N. H. (left), and S. A. LORENS, North Electric Mfg. Co.

both power lines and already existing telephone circuits.

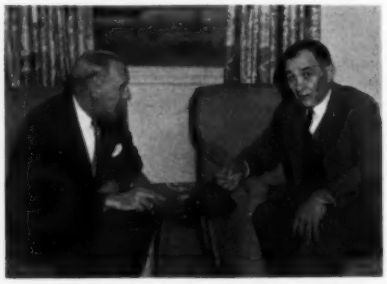
Although the use of power line carrier still is regarded in many quarters as being on an experimental basis, its adoption as a practical means of providing service to remote areas now served by power lines merely is awaiting the production of units in adequate quantities. Production actually is under way and is being stepped up as rapidly as possible in order to meet a demand already many times in excess of earlier estimates. It is confidently expected that well over 1,000 rural customers will be reached with power line carrier telephones shortly after the end of this year.

In addition to installations made by Bell System companies almost a year ago in Arkansas and Alabama, these companies have added or are planning commercial experimental installations of power line carrier equipment in South Carolina, Texas, Virginia, Colorado, Washington and Vermont. In the latter state, the equipment will furnish additional facilities over an existing telephone circuit. Such an application of this carrier equipment offers interesting possibilities to companies whose pole lines adequately cover the territory served while their circuit capacity is completely filled.

The Carolina Telephone & Telegraph Co., Tarboro, N. C., and the Southwestern Associated Telephone Co., Lubbock, Tex., appear to be the first of the Independents to use power line carrier equipment. Both of them will receive their equipment this month. The former's installation will utilize power circuits of a private power company near Nashville, N. C. The latter's installation will be on the lines of a local REA co-operative near Lamesa, Tex. These installations, both experimental, have been sponsored by the Facilities Task Group of our Rural Telephone Service Committee. The equipment that is being used for the two Independent company experiments was obtained by the task group on loan from the Bell System. While Independent telephone equipment manufacturers have been offered a royalty free license under Bell System patents for the construction of power line carrier equipment, none of them appeared to have equipment available for the first Independent experiments. Telephone people interested in the possibilities offered by this type of equipment are cordially invited to visit the sites of the experiments in order to observe actual field operation.

Some undesirable service conditions have developed naturally as a result of material and manpower shortages during the war. It has been necessary to face some lowering service standards in order to serve the greatest possible number of customers. Service improvement programs have included such things as more selective ringing, conversion from magneto to common battery or dial and fewer parties on a line. Nationwide customer surveys have shown that these improvements are ones most desired by rural users. But all too frequently it has been necessary to determine whether or not a service objective of not more than eight on a line should be sacrificed temporarily in order to serve a greater number of people. We all know what the answer to that one has been.

Left to right: C. F. MASON, Santa Monica, Calif; ROBERT A. GANTT, International Telephone & Telegraph Co.; C. E. JOHNSTON, Spokane, Wash.; H. M. ENGH and C. E. JONES, both of Erie, Pa.



Automatic Electric's F. A. DAVIS (left) and F. E. BEHM, Lincoln, Neb.

Likewise other undesirable service conditions have developed. They are being overcome as rapidly as possible. Complete restoration of service to peacetime standards cannot be accomplished immediately, but corrective action to provide reasonable service improvements may be. This naturally includes every possible aid to service line companies. It is essential that the construction and maintenance practices of service line companies be as good as those of the commercial company with which they are connected, otherwise the over-all service of the latter is certain to suffer.

In order to speed up the program of rural expansion, many companies have liberalized their free construction allowance. Not only are they increasing the amount of pole line which they will build without charge to the customer, but, as a result of the new economies, they have been able, also, in some instances, to reduce the charge for work beyond the free construction limit. Where construction charges are required, many companies spread those charges over a number of monthly billing periods.

But it is not necessary to revise all tariffs and charges downward in order to conform to the objectives of the rural program. In all too many instances, rates for rural service are inadequate, regardless of the standards by which they may be measured. The general rise in wages and other expenses which the industry has experienced since about 1941 is forcing an adjustment in telephone rates that only can be on the upward side. This adjustment should have no adverse effect on rural telephone development. It seems to be a human trait to value lightly anything which costs little or nothing. Too cheap telephone service is no exception to this phenomenon. On the other hand, adequate rates afford the best assurance of area coverage and a high standard of rural telephone service.

And last, but by no means less important than the other four activities, is the matter of keeping the public well informed of the progress being made and the plans under way for extending rural service. This calls for widespread use of all types of publicity media. Here the Telephone Advertising Institute can lend a hand in furnishing well designed cuts and mats for newspaper advertising.

Window cards and envelope stuffers carry the message that the rural program is going full speed ahead. News releases are being used to tell the local story and to trace progress of new construction and new development. Some companies even have gone on the air, participating in regular farm programs in order to discuss for the benefit of the farm customer such matters as rural party line usage, the over-all construction program and the liberalization of free construction al-

(Please turn to page 86)

REPORT ON TOLL COMPENSATION

By E. M. BLAKESLEE

Chairman
USITA Toll Compensation Committee

THE published report of the Toll Compensation Committee rendered in the fall of 1945, carried as the principal item on the committee's agenda the matter of weighting the line haul mileage of the Independent telephone companies on intra-state proratable business interchanged with the associated Bell telephone companies.

In the settlement of the issues in FCC Docket No. 6468, arrangements were made whereby the line haul mileage of the associated Bell telephone company and that of its Independent connecting companies would be given a weight of two, as against a weight of one for the long lines mileage, in order to give effect to the higher cost per mile of toll circuit incurred by the Independent company and the lower utilization of such Independent toll feeder circuits. This two-for-one weighting is now reflected in currently effective prorate studies.

This treatment of the long lines traffic prompted the committee to question whether or not a similar principle should be introduced for prorating the line haul revenue derived from the intra-state business interchanged with the respective associated Bell telephone companies. This question implied that studies would show that the Independent company's toll circuit costs and the volume of traffic being routed over these circuits, when compared with the experience of the associated Bell telephone company, would justify alloting the Independent company's mileage a weighting on the intra-state business as well as on the AT&T company business. Tentative figures and studies supporting the above contention were presented to representatives of the AT&T in New York on December 6 and 7, 1944. At a further meeting held in Chicago on September 11 and 12, 1945, an understanding was reached as to the methods and principles to be employed in weighting all of the proratable mileage of the Independent company, whether used for intra-state or long lines traffic. As a result of these conferences and the understanding reached therein, the committee requested data from 184 representative Independent companies, to enable it to evaluate the level of a schedule of weighting factors to be applied to the Independent company's line haul mileage.

Coincident with this study relative to the application of a weighting factor to proratable tolls, the committee presented to representatives of the AT&T evidence of the necessity of further increases in terminal compensation to the Independent telephone industry in recognition of the increases in operators' wages experienced by the Independents since the last upward revision of compensation in February of 1943.

From the data obtained by the committee from the 184 Independent companies, the Bell System engineers were able to distinguish a pattern and develop a schedule for weighting all line haul mileage of the Independent company. In this schedule the total number of telephones at each originating exchange determined the selection of the weighting factor for application to the proratable business from each exchange.

E. M. BLAKESLEE

The prorate weighting schedule as finally developed provided for a weighting of two-for-one-at prorate points or changes serving up to 150 telephones, a weighting of 1.9 for exchanges of from 150 to 300 telephones, 1.8 at exchanges of 300 to 500 telephones, etc., down to exchanges serving over 25,000 telephones where the weighting was entirely eliminated. It was understood that this weighting schedule would apply alike to all proratable traffic, whether intra-state or long lines, and that the present separate weighting on AT&T company business would be discontinued. This schedule, when applied to the over-all record of prorate traffic available to the Bell System produced a composite weighting of some 1.63.

The adoption of this schedule was to be predicated upon the acceptance of a change in the method of prorating tolls from what has been called the "Gross Prorate" method to a "Message-Mile" basis. The committee has consistently maintained that the Gross Prorate basis gives due and proper effect to the various classes of traffic handled and the time of day at which the Independent company lines are used, and this original contention has not changed. It was stressed by the committee that changing from the Gross Prorate basis to the Message-Mile basis without any weighting, even though made coincident with the introduction of the prorate weighting schedule, might, by reason of the characteristics of the traffic, simply be accomplishing a redistribution of the present prorate revenue by taking away from one toll line company and giving to another.

The Bell System representatives pointed out that there is already some element of weighting contained in the Gross Prorate basis of dividing line haul revenues and that, if the Gross Prorate basis is to be retained, then there would have to be a revision in the weighting factors since they had been developed on a cost per message-mile basis. It was finally agreed with the Bell System representatives to retain the Gross Prorate basis with a flat weighting factor of 1.25 applied to all traffic at all proratable exchanges.

Schedule A payments are presumed to cover such costs as billing and collecting, promotion of the business and the station-to-station increment of toll costs included in exchange operations. Compensation for these functions is expressed on a unit or ticket basis. Now, while it is true that commercial costs and clerical wages have increased, the companies are handling such greater volumes of toll business that unit costs have not correspondingly advanced. We were unable to substantiate with Bell System representatives any increase in Schedule A-2 payments. The Bell System representatives proposed, however, to increase Schedule A-1 by approximately two mills, to eliminate the necessity of the so-called make-whole payments now being made to certain companies by reason of moving the time that night rates become effective from 7 p. m. to 6 p. m.

As to the committee's request for an increase at this time in the levels of

Schedule B, the associated Bell telephone companies are ready to offer to the Independent industry, retroactively to July 1, 1946, new and revised schedules computed to accrue to the Independent companies $3,428,000 additional revenues annually. Normally, additional terminal compensation is attended by a loss in prorate revenue, but due to the retention of the Gross Prorate basis and the substitution of a weighting factor of 1.25 on all proratable traffic for the present two-for-one weighting on Long Lines traffic only, the industry has, for the first time, not only been made whole on the prorate, but it stands to gain some $128,000 in addition. In other words, Schedule B payments are increased $3,428,000 and prorates increased $128,000, making a total gain to the industry $3,556,000.

A tabulation of the net result of the above referred to items is as follows:

I. Commission payments increase in Schedule B.....		$3,428,000
II. Prorates		
Weighting of 1.25.....	$1,420,000	
Loss due to elimination of two-for-one on long lines	455,000	
Loss of prorate due to increased Schedule B.....	837,000	
		$ 128,000
III. Total		$3,556,000

I have purposely refrained from discussing any over-all percentage figures for the obvious reason that the nature of any given exchange's traffic will determine the percentage increase which that exchange will receive for operating functions.

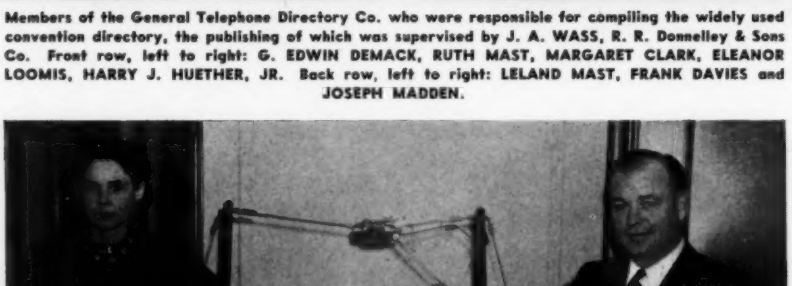
As a concluding remark, I should like to point out to you that in our conferences with the Bell System representatives we were reminded that the increased compensation was being proposed in order to offset increased costs as evidenced by the reports of those companies that have actually experienced substantial increases. The amount offered, therefore, anticipates that all companies have experienced as of this date similar increased costs; and, accordingly, if there are any Independent operators who have not yet made wage adjustments, the cost thereof, when so made, may not be claimed as evidence for further increases in toll compensation.

C. D. HERSHEY, Warren, Ohio (left), and GUSTAV HIRSCH, Columbus, Ohio.

ELMER DAVIS, Portable Products Co. (left) and ROY WELLER, Weller Mfg. Co.

Members of the General Telephone Directory Co. who were responsible for compiling the widely used convention directory, the publishing of which was supervised by J. A. WASS, R. R. Donnelley & Sons Co. Front row, left to right: G. EDWIN DEMACK, RUTH MAST, MARGARET CLARK, ELEANOR LOOMIS, HARRY J. HUETHER, JR. Back row, left to right: LELAND MAST, FRANK DAVIES and JOSEPH MADDEN.

R. C. RENO, Editor of TELEPHONY (left), and J. W. WOPAT, International Telephone & Telegraph Co.



MR. AND MRS. D. J. NEALE of the Cable Spinning Equipment Co.

HORACE CAMPBELL, Electric Storage Battery Co. (left) and WILL V. PARKER, North Electric Mfg. Co.

EMPLOYMENT RELATIONS

By JOHN H. AGEE

Chairman, USITA
Employment Relations Committee

THE Employment Relations Committee of your association has concerned itself mostly with proposed national legislation during the past year. As you undoubtedly recall, the association was interested in several bills introduced in one or both branches of Congress having to do with the amendments to the National Labor Relations Act, amendments to the Fair Labor Standards Act, and the Gwynne Bill, which if enacted into law would have supplied a definite statute limitation in all federal law which did not contain any provision regarding the period of limitation for filing suits in violation of its provisions.

Clyde S. Bailey already has reported to the convention the failure of Congress to pass any of this proposed legislation. This, however, does not mean that we should not express appreciation for the very fine work which our committee, under the direction of J. C. Crowley, Jr., and Mr. Bailey, did in Washington. Congress was so overburdened with what appeared to it to be more important legislation, growing out of the so-called reconversion period following the termination of the war, that these less important matters were side-tracked. All labor legislation of importance either failed to pass Congress or was vetoed by the President and not passed over his veto.

Most important of these bills undoubtedly was the Case Bill. This bill, as originally drawn, offered some hope that labor disputes and extended strikes might be eliminated or much less decreased by the use of fact-finding commissions. Its terms were modified greatly before passage, nevertheless, it did not suit the labor leaders and was thereupon vetoed by President Truman. Considerable effort was made by labor organizations to amend the Fair Labor Standards Act by increasing the minimum wages from 40 cents per hour to 65 cents per hour during the first two years after passage of the act, 70 cents in the third and fourth years, and 75 cents thereafter. Both Mr. Crowley and Mr. Bailey appeared before the labor committee in the House and the committee on education of labor in the Senate in opposition to this amendment. While we claim no victories in the matter of legislation, we do have a right to feel that the presentation of the adverse effect upon the smaller segments of the telephone industry of the passage of such legislation may have been helpful in obtaining its final postponement.

However, we anticipate that this or similar legislation will be introduced in the next session of Congress, and the directors of your association undoubtedly will decide what further action they desire this committee, or some other committee, to take with reference to it.

With the surrender of Japan, the War Labor Board with its power to increase wages was replaced by the Wage Stabilization Board, and all control over increased wages was released, except in those cases where increased wages would result in increased prices. Our contention always has been that the Price Control Act passed by Congress in the first months of the war did not include control of wages in the public utility and communications field, but it did require a 30-day notice in the Office of Price Administration of any applications for increased rates on the part of utilities, which notice usually resulted during the past four years in appearances by the OPA at hearings before state utility commissions, and objections to any attempt on the part of telephone companies to increase rates. The OPA still insists that it must receive this notice. There is some question about the interpretation of recent orders and regulations of the OPA in spite of Supreme Court decisions clearly stating that the OPA has no power to determine or regulate public utility rates in states where that function has been delegated by law to the utility commissions. I am, therefore, of the opinion that the safest advice, to give to any telephone company which is increasing its wages, is to send a letter to the Wage Stabilization Board in Washington, notifying it of the increase. This notice can be sent within 30 days after the increase is put into effect and then is construed as reserving the right to apply for increased rates thereafter to cover your increased wage costs.

J. H. AGEE

There are many sides to establishing and maintaining good employment relations. We shall not discuss them here, both for lack of time and because the necessity for paying good wages and providing good working conditions are too well-known to need argument or discussion. Because most of the larger Independent companies' employes now are organized or now are considering organization, it might be appropriate to comment that the labor situation in this country should not be considered hopeless. We need a better understanding of facts by both management and labor. Collective bargaining should mean more than demands and name calling.

It is our notion that many of the strikes in this country might have been avoided if leaders of labor and top management had shown interest enough in their negotiations to look at the facts squarely and negotiate without prejudice and bitterness. This may be too idealistic, but not until we deal with honest and reasonable men on both sides can we hope to have a discontinuance of the unhappy situation which exists in our country today. In the September 12 issue of *Public Utilities Fortnightly*, Robert C. Simpson, chief industrial relations councilor for the Gilbert Associates, Inc., New York City, presents an intelligent picture of the situation under the title of "Post Labor Difficulties in the Utility Field." I suggest that each of you, if you have not done so, read this article carefully.

The political power of organized labor in our federal government has been demonstrated by the passage of such legislation as the Wagner Act (National Labor Relations Act), which even many labor leaders concede is too one-sided. The U. S. Supreme Court in the Brandeis Case attempted to clarify some of the apparent inhibitions in the act, which prevented management from

talking with employes regarding the organization and operations of unions. In that case the Supreme Court indicated that any law which prohibited freedom of speech would be unconstitutional and held that a letter which the Brandeis company of Omaha had written to its employes at the time they were organizing, discussing the advisability of joining a union was not a violation of the act. The National Labor Relations Board thereupon liberalized its attitude in complaint cases where employers were charged with having made statements which might be construed as influencing their employes in the matter of joining a union, but recently the same board with different members has reverted to its original attitude of practically sealing the mouth of management, thereby taking away the right of employers to discuss union matters with employes. Certainly the time has arrived that Congress should have courage enough to change the National Labor Relations Act and see to it that management has an equal position with labor in handling labor problems.

It must be apparent to every telephone manager today that we definitely are in a period of high operating costs. We have no figures to show the percentage increase in direct labor costs, but it is a reasonable statement to say that our labor costs have more than doubled in the past 10 years. In spite of the Price Control Act and the operation of OPA, we find that costs of practically everything which we use in the telephone business—equipment, apparatus and supplies of all kinds, have increased materially, reflecting, of course, the increased cost of labor.

In the case of the Lincoln company, operating 80,000 telephones, costs for maintenance, alone, increased from $7.56 per telephone in 1940 to $12.96 per telephone in 1946 (using the month of August of each year as a basis of comparison), an increase of 71.4 per cent in five years' time. The total costs of providing service per telephone, not including depreciation, taxes or interest on the investment, increased from $20.76 in the year 1940 to $39.12 in the year 1946 (using the same basis for comparison), or an increase in cost of 88.4 per cent. Most of this increase represents labor costs and higher wages. In spite of this terrific increase in operating costs during the past five or six years, we still are furnishing service to our rural subscribers for $21 per year. The most amazing thing about this picture is that the telephone industry as a whole has been able to meet this increased cost without increasing rates to its subscribers. The reason, of course, is because the volume of business, particularly toll business, has increased in proportion to our increased operating costs. Our experience rather supports the contention of many economists and of leaders in the large industries that prices can be held down if production shows a corresponding increase with operating costs, but when production is stopped entirely by strikes, or when labor chooses to loaf on the job, then it is apparent that the only way business can survive is to have substantial increases in the price of its products or services.

You may not be interested in a discussion of strikes, and I have no intention to engage in such a discussion, but our industry has been threatened throughout the country this past year with strikes and work stoppages, and I think it is proper enough to suggest to management today that we do our utmost in our negotiations with our employes, whether they are organized or not, to meet their problems, which in the final analysis are our problems, in an intelligent manner so that we can avoid interruptions of service in an industry so vital to the public welfare as the telephone business. I quote from a recent article discussing strikes:

"I will defend to my last day the right of workers to join or not join any union they please, if it is not dominated by Communists whose loyalty is to a foreign power, and so long as the union does not use force against the rest of us, such as industry-wide bargaining and the closed shop.

"But somehow this strike business has got to be harmonized with the right to work—the right of millions not involved, to earn their daily bread."

The article stated that series of strikes in smaller plants supplying the company with parts and materials has cost Studebaker workers and their families $20,000,000 in lost wages.

I quote from the president of a manufacturing concern in the Middle West, who employs more than 1,000 people in his plant. He said:

"It is certain that unless labor and management work together peacefully and without strife, production is lost, the country stagnates and our families go poorly clothed, ill fed and unhoused.

"I have studied a lot over it all. I am puzzled. Both sides in every strike feel they are right; both concede the other party is sincere and honest—but like a snowball started down the mountain, strife and hatred grow and grow until they become an avalanche that destroys everything and everyone in their path."

There is a natural disposition on the part of American people whenever we are confronted with an unpleasant situation to say, "There ought to be a law to prevent this or that," and because so much national legislation the past 10 years has made it difficult for management and labor to cooperate as we feel they should, we naturally seek some remedial legislation; but whether that comes or not, I am one who feels that there should be enough brains and intelligence in the representatives of both management and labor to settle their differences, without bitterness and without strikes. Mr. Simpson, in the articles to which I have heretofore referred, presents some pessimistic views. He says among other things that, "Interference with management's exercise of its bona fide prerogatives is growing. The union is attempting more and more to become the complete boss of the business which it does not own." Mr. Simpson points out that the trend to elimination of no-strike guaranty in union contracts is growing.

In conclusion let me express the hope that better days may be ahead of us. The pendulum of public sentiment swings to and fro, oftentimes in accordance with economic conditions; sometimes it is influenced by political situations, and more recently, it has been influenced by world-wide conditions. The high-priced era is here, and because it brings with it standards of living which the American people never willingly will surrender, we are inclined to feel that we are confronted with a period of inflation which will extend for a number of years ahead. We can hope that it does not get beyond control. No one wants to see our economic structure thrown into chaos. The telephone industry will, out of necessity, adjust itself to high costs, and if the experience of the past 12 months is a criterion, then the American public is prepared to use telephone service in whatever form our scientists and engineers may devise in the years ahead of us, regardless of its costs. But if our service is to be satisfactory to the public, it goes without saying that our employment relations must be equally satisfactory. Satisfied customers are the result of good service and good treatment. Satisfied employes are necessary if we are to provide good service. Cooperation and a sincere desire on the part of both management and employes to understand their mutual problems, is the foundation upon which rests good employe relations and good public relations. It is the keystone in the arch of success.

>> *The true epic of our times is not "arms and the man," but "tools and the man," an infinitely wider kind of epic.*—**Carlyle.**

MECHANICS OF DIAL CONVERSION

By C. E. JONES
Chairman
USITA Plant Committee

THERE was a day, perhaps, when a good telephone man could stand in the public square of a small town, and, with central office equipment costing a mere $20 per line, could completely engineer a job out of his head with accuracy enough for the investment involved. But with present-day equipment worth $100 a line, more or less, and of ever increasing complexity, the present-day operating company — large or small — cannot afford to treat central office equipment in a haphazard manner.

Every department of a telephone organization will be called upon to assemble information in preparation for a conversion of a manual office to dial operation. For example:

The plant department supplies the quantity of equipment items at present available, and the extent to which it is in use.

The commercial department supplies a forecast of station and line growth for a specified period of time following the proposed cut-over and a recommendation for the ultimate size of the office for the expected life of the equipment.

The traffic department then uses this information as a guide to the amount of subscriber line and connector equipment required at the time of conversion and for the ultimate size of the exchange. The information which the traffic department must pass on to the engineering department is quite obviously the equipment item quantities, such as number of line-finders, selectors, and connectors of the local or toll train, if there is to be one, and the number of inter-office trunks required for toll and free-service traffic, if any. Given the above mentioned data from plant and commercial, traffic data must be compiled and applied to arrive at the answer—the equipment item quantities.

Traffic data must be collected in a manner which will permit trunking calculations for both terminal-per-line and terminal-per-station exchanges, since the latter must be used in certain-sized exchanges to permit the numbering scheme to conform to intertoll dialing requirements. A description of this last mentioned type of central office at this point might better your appreciation of the traffic information requirements.

The more familiar terminal-per-line arrangement involves line equipment and connector terminals permanently cabled together at the main frame. Party lines usually are handled by frequency-selecting connectors.

The terminal-per-station arrangement, which is not new but has been used so widely by Independent companies, includes a line intermediate distributing frame, or simply, a LIDF. The line equipment and connector terminals are cabled separately to the frame. An outside cable pair is connected to the line equipment and connector terminal by cross-connecting. Party lines involve the use of a so-called bunching block, which is merely a convenient means of connecting together (1) the cable pair, (2) the line equipment, and (3) any number of connector terminals, depending on the number of parties to be served by the cable pair.

C. E. JONES

The pressing need to use the terminal-per-station system has been to allow a greater number of subscribers to be served without exceeding the four-digit line number limit which is specified by the proposed intertoll dial system requirements. Four digits will accommodate 8,000 subscribers without using "0" or "1" as initial digits of subscriber line numbers, or from 3,000 to 4,000 lines, depending upon the line fill of the office. A four-digit, terminal-per-line exchange, not using "0" or "1" as initial line digits, will accommodate only 800 party lines or 1,600 to 1,800 subscribers, depending on the line fill.

The original reason for using a terminal-per-station system, and a very important one, even though secondary at the moment, is to allow complete flexibility to (1) distribute the originating load throughout the dial system without changing the subscribers' numbers; (2) to allow a subscriber moving from one party line to another without number changes, and (3) to permit regrading of a subscriber's service within an exchange area with no change of number. The need for intercepting is reduced to an absolute minimum as all dead numbers may be automatically intercepted.

The traffic information required by a terminal-per-line exchange, mainly deals with line calling rates, but with the terminal-per-station arrangement the line equipment is concerned with line calling rates averaged for the entire office, and station calling rates by classes of service to be included in the various connector groups.

Information which is sufficiently complete to allow computations for either type of exchange consists of the following general items:

(1) Busy hour number of calls and holding times for both originating and terminating local traffic by classes of service as follows: Rotary lines, individual lines, two-party lines, four-party lines, multi-party lines and pay-station lines.

(2) Point-to-point studies of all trunk traffic involving the exchange in question to determine the most desirable method of handling the trunk traffic.

(3) Usage studies (jack count) on all trunk groups corresponding to the proposed trunk groups as determined by the point-to-point studies.

The mechanics of collecting this data might merit mention at this point.

Quite obviously, the number of calls originating or terminating in any trunk or line group is usually counted by an ordinary traffic meter. It is the practice to provide such meters for this purpose according to the requirements set forth by the traffic department. The ultimate effectiveness of them, however, depends on the accuracy and consistency with which they are read, and their state of maintenance by the plant department. Portable meters often can be used to advantage where permanently installed meters do not exist.

Certain manual exchanges may be equipped with meters on the cord cir-

cuits to count total calls handled, but usually a manually operated peg count meter is employed. Secondary studies may be made if class of service information is required.

Holding time can, of course, be measured visually with aid of a stopwatch. The inefficiency and inaccuracy of such a method has been avoided by a very simple device. A meter, connected to the line or trunk being observed, registers each call and, at the same time, starts an electric clock which runs for the duration of the call. The average holding time is available by dividing the difference between the initial and final clock readings by the total number of calls as registered on the meter.

Point-to-point studies of the toll traffic may be made from the toll ticket records which show the number of calls for a specified length of time, handled over each possible route involving the particular office being considered.

Usage studies are made by visually counting the number of trunks, cords or switches in use simultaneously, at one-minute intervals. Tabulated information may be applied to the results of these studies to accurately determine the number of unit calls being handled by the group.

The features of circuit operation must also be decided upon in addition to the quantities of equipment items. The engineering department works these out with, mainly, the traffic department, with previous experience as a guide. The technical details of the equipment are beyond the scope of this talk, which is intended to acquaint you with the data the engineering department — and the equipment section, in particular—requires when considering the conversion of a central office to dial operation.

Having the equipment item quantities from the traffic department, the next logical step in the conversion process is for the equipment engineering section to draw up the specifications which will inform the supplier exactly what material and apparatus is required. But before we go further into the equipment engineering phase, I would like to digress a moment to present a brief background of engineering procedure, as practiced in the industry.

In general, there are two extremes and a "middle road" approach to any problem — and this is the case with equipment engineering. One extreme is the "precise" approach, practiced by the Bell operating companies. With this approach the traffic department's equipment item quantities first go to a circuit engineer. He scrutinizes both the quantities and the operating features desired. From this point on, his part of the problem is solved with a procedure not too different from that you and I may have used with a Sears Roebuck catalog. From a key-sheet applying to the general type of equipment he proposes to use, he picks standard circuits prepared and tested by the Bell laboratories and he appends option and figure references to specify precisely the operating features desired.

Left to right: HOWARD FINE, Waterville, Minn.; RALPH VAN TRINE, Durham, N. C.; C. D. MANNING, Kellogg Switchboard & Supply Co.; ROY AUTRY, Lubbock, Tex., and VERNE CLARK, Pekin, Ill.

Left to right: F. J. HEAVENS, Lorain Products Co.; N. D. STOKER, American Crossarm & Conduit Co.; MRS. ALLENE DREW, Quincy, Fla., and JOHN F. JAAP, Cook Electric Co.

Circuits having been chosen, the equipment engineer takes over from the circuit engineer, with his cross-reference information between the circuit schematics and the equipment layout and assembly information. Without going into detail, it is sufficient to state that the finished product from this "precise" engineering takes the form of a bill of material to the manufacturer, who in normal times can, to a considerable extent, pick the exchange from the stockroom shelf.

For the want of a better word the other extreme might be termed the "casual" approach to the conversion engineering problem. Far too many small (and sometimes surprisingly large) operating companies ask a manufacturer to supply a switchboard with so many trunks and lines—ignoring traffic information and applying only a casual background of the commercial aspects of the project. The manufacturer finds the product of such an approach quite different from the "stock list" resulting from the so-called "precise" method. The net result is quite liable to be wasteful of equipment if the manufacturer has a promotional tendency, or inadequate if he is bent on under-cutting possible competition. Most operational features are likewise left to the judgment of the manufacturer to make them fit the application. In this case, therefore, the manufacturer must do both application and production engineering and the purchase price must be higher to include these services.

As any operating company grows, it naturally swings further away from the "casual" approach towards the "precise" one. The rate at which this is done, and extent to which it is carried out, depends, obviously, on the attitude of the management and the capability and adequacy of the engineering personnel.

No doubt the natural question at this point is, "If the manufacturer's price can include a certain amount of application engineering, to what point is it economical for the operating company to assume the application engineering work?" The answer will not be developed in this short talk, but it is sufficient for the purpose at hand to note that we should perform enough of the

application engineering to insure that the equipment obtained will perform all functions necessary to meet the needs of the subscribers it is to serve.

So much for the background of the engineering approach. Let us consider a sensible "middle-road" method of engineering.

The specifications that the equipment section prepares, and on which the manufacturers are asked to bid, specify the operational features in detail and constructional features as completely as possible with an eye on standardization and simplification. It is unfortunate that the press of conversion work at the moment does not allow more effort to be expended along standardization lines when so many conversions are pending. Companies using several manufacturers' equipment, have a problem practically unknown in the Bell System and in the very small connecting companies. The central office maintenance personnel find themselves "jacks of all trades" to cope with the complications and peculiarities of a dozen makes of equipment. In addition to this maintenance inconvenience, the economic waste arising from the duplication of effort of re-engineering equipment details concerning problems which have previously been solved should be avoided.

Even within the engineering of a single Independent manufacturer, a lack of such standardization often exists. The result which plagues equipment engineers and plant equipment men alike, is a needless condition where two switchboards, externally identical, internally will contain equipment and circuits totally dissimilar.

Any reasonable person will agree that equipment standardization should be striven for. However, we should not make the erroneous step to assume that dial switchboards can be standardized to the extent of ordering them like models of automobiles. This has been attempted and it has been found that every application presents different equipment requirements. The Bell System recognizes this with the multitude of options available on standard circuits. One Independent manufacturer has recognized this fact in small unattended offices in a similar manner. Application engineering, therefore, can be reduced and simplified by standardization, but *not* eliminated.

Treatises have been written and are yet to be written which attempt to reduce to a formula, the selection of the type of equipment required for a given project. Far too many variables are present to allow the answer to be that simple and yet accurate. Let us consider a few of the more general and important ones for a moment.

S. A. BROOKS, Page & Hill Co. (left) and D. C. GIBSON, Leich Sales Corp.

The terminal-per-station system, mentioned previously, surprisingly enough, does not cost appreciably more than the terminal-per-line system *for certain types of equipment.* The extent of this variance depends upon a multitude of details such as the size of the exchange, number and arrangement of inter-office trunking, etc., which will not be injected into this general discussion at this time. Broadly speaking, this variance is not large for machine and switch type systems, but is sometimes prohibitively large for relay type systems. Recently we have witnessed such a variance of as much as 15 per cent for a 600-line office.

We have mentioned the three types of dial systems at present available—machine switching, switch and relay types. In general, it is pretty well accepted (outside of the manufacturer's advertising copy) that machine switching equipment is most satisfactory for large offices, switch type for medium-sized, and relay for small offices. The widely disputed points are the exact office capacities with which "small," "medium" and "large" offices are defined.

Machine switching systems have the inherent feature of translation, which can be taken advantage of in large multi-office areas to simplify and make more flexible the inter-office trunking. With toll dialing hounding us to simplify numbering schemes, this point takes on added significance.

Switch type exchanges find their most economical application in systems less than 10,000 lines per single office. The types available to Independent companies are all unit-mounted and are the most simple and flexible of all types of dial systems. Regrading and redistribution of equipment is easily done to meet changing traffic conditions, and additions involve little more, if any, extra work to perform as compared with the original installation of similar equipment units.

Relay type systems are generally conceded to be the most satisfactory for small, unattended installations. The largest sized office in which this type of installation is justified is a hotly-contested question. Some organizations have decided that this point should be 600 lines ultimate, but there are significant facts that might, upon further investigation, indicate that this figure is too large. It is interesting to note that the consensus of engineers, not employed by manufacturers or users of relay type equipment exclusively, is that this figure is 200 lines.

Be that as it may, we should not overlook the following important considerations with regard to relay type equipment:

(1) Critical mechanical adjustments which could be affected by heat and moisture are avoided in relay systems.

(2) Contact and relay adjustment can lead to much more serious complications in relay systems than in switch type. The skill required of maintenance personnel is approximately double that required on other systems.

(3) Additions to existing exchanges, except where this can be done by additions of complete units, are extremely laborious and expensive. A link for the smallest 30-line PBX requires 3,000 wires to be soldered to relay contacts. A 100-line link involves $200 of material and $170 of labor to install. A similar addition in a switch type system might involve $125 material and from $1.00 to $5.00 labor. It should be noted that at least one manufacturer of conventional relay type systems is attempting to adopt unit-type mountings. This will increase the material cost slightly, but will decrease the labor required to make additions, appreciably.

(4) Since relay equipment items are more involved and, therefore, more expensive than switch or machine switching items, for a given equipment expenditure, less trunking can be supplied. Trunking equipment savings allowed by such devices as 200 point line finders and connectors are often uneconomical in relay system where 10 gang relays and several control relays are far more expensive than an extra set of bank contacts and one or two transfer relays, as required by switch and machine type systems.

(5) Conventional relay systems take from a quarter to one-half again as much floor space as switch type systems, depending upon the trunking capacity being supplied, and assuming equal aisle width is considered for each case. Large equipment entrances required to accommodate the relay cabinets are not required by modern switch systems, the components of which could be carried by hand up the average stairway, if necessary.

(6) The pre-selection principle, on which most relay systems depend, makes grading of large trunking groups difficult if not impossible. Less efficient and flexible expedients are resorted to, therefore, relay type systems rarely include trunking IDF facilities, and trunking materially in excess of 10 per cent involves considerably more involved selection circuits as has been demonstrated by offices in which it was

(Please turn to page 88)

UNATTENDED EXCHANGE BUILDINGS

By RAY T. KIEREN
Lafayette, Ind.

AT THE present time and in the immediate years to follow, properly designed buildings to house small unattended dial installations will be more in demand than ever before. Most companies have a building construction program calling for several such buildings to be erected in the immediate future. For many, it will be their first attempt at unattended operation. Those that have had experience in the construction, operation and maintenance of this type of property have profited through experience and learned to correct many of the less obvious problems by observation of completed projects, scheduled at intervals that permitted study and corrective planning for future application.

The urgency of today's requirements leaves little time for extensive planning and research beyond the actual job requirements; however, to avoid mistakes of the past and benefit by them, it is well to point out certain features to be eliminated and others to be included in the design and construction of future unattended office buildings.

With market conditions and prices what they are today, together with the scarcity of materials, new problems are added for the experienced, as well as the inexperienced operator planning a building program. The cost of construction must be kept at a minimum and yet be consistent with proper protection for the equipment. In the following remarks I hope to outline a proposed type of building that will meet favorably those two objectives: Low cost and suitable protection, through design and choice of materials.

Assuming that a suitable lot has been acquired, well situated with respect to the wire center of distribution, free from fire, dust, flood hazards and conflict with high tension power lines, and that the load bearing resistance of the soil is adequate and well drained, we can proceed with our building project.

The proper housing of small unattended telephone systems need not involve elaborate or expensive facilities. All that is required is that reasonable precautions be taken to protect the equipment against damage by the elements, and that the equipment be located suitably for proper supervision and maintenance.

Consideration should be given to the exterior appearance of the building and its location on the lot, so that it will harmonize with surrounding architecture.

Fireproof or semi-fireproof construction is recommended. Face brick (glazed or hard burned), hollow tile or metal should be specified. Poured cement or concrete block, if well waterproofed, may be considered but past experience indicates this type of construction is more subject to wall fractures than the former types. In certain

R. T. KIEREN

parts of the country, free from moisture and frost, stucco on metal lath has proved satisfactory.

A major consideration in the design and construction of an unattended central office building is the control of condensation of air moisture. Air moisture is present in all buildings regardless of materials used or the building's location.

Geographical location does not accurately determine humid areas; elevation above sea level, topography of the land, nearby bodies of water, vegetation and other conditions may greatly affect the percentage of relative humidity of a comparatively small territory.

The effects of high humidity on electrical equipment are of two kinds: Troubles caused by moisture absorption, such as low insulation in cables, wires and insulating materials, and troubles caused by condensation, as corrosion of metal parts, stickiness of lubricants and film deposits on contacts. Condensation will also contribute to absorption.

Realizing that humidity is a hazard to the continued good operation of all electrical apparatus, it should be eliminated in the unattended office building by the most economical methods. Its control should be a part of the building's design.

In the foregoing remarks I mentioned that the building must protect the equipment from the elements. Assuming that condensation of air moisture is an element, we must first understand the basic reason for its presence before we can devise means to control it.

Science informs us that the normal moisture content of air is dependent on its temperature. As the air temperature increases, its ability to hold more moisture is also increased. Relative humidity is the ratio between the amount of moisture present in the air at a given temperature and the amount that would be present if the air were saturated. Therefore, when the temperature of air is lowered so that the moisture present will be enough for saturation we have reached the dew point and precipitation is present as the temperature is lowered beyond this point.

This procedure is much the same as a wet sponge suspended in mid air. It will hold a certain amount of water without dripping, if squeezed, some of the water will fall away in the same manner as reducing the air temperature at the saturation or dew point.

You who have experienced this condensation in exchange building realize that it is most pronounced in the spring and fall. In these seasons we experience the greatest variations in day and night temperatures. Also during these seasons the greatest moisture content is present in the air. During the day, great amounts of moisture are carried in the air at a high temperature, and during the chill of the night this moisture is released to settle on the walls and floor of the building.

We must accept this condition as a natural law of physics: Our only escape from it is to eliminate the moisture from the air within the building and prevent the admission of fresh moisture laden air as much as possible.

To accomplish this omit windows, air vents or grills in your building design and provide metal weather stripping around the entrance door. If natural light is desired within the structure, use glass block.

Install an air circulating chemical dehydrating unit within the building, equipped with humidostat control.

In this manner the moisture content of the air within the building is always low enough so that the average low temperatures experienced in this country will not cause a dew point to exist.

The moisture I mentioned that gathers on the floor of many unattended office buildings cannot altogether be accounted for by condensation. It may be partially caused by the building design if the floor slab is laid directly on the grade regardless of cinder fill or sand bottom. That water on the interior floor has been pumped through the floor slab by capillary attraction.

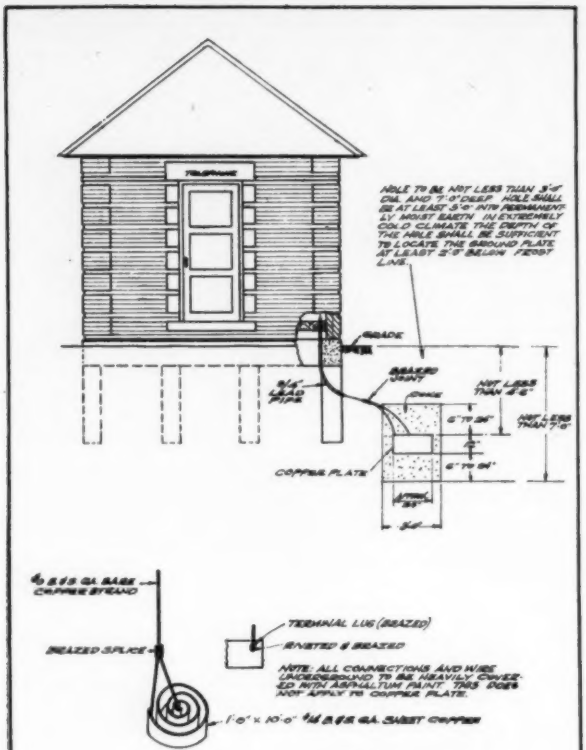
We know that when a solid substance such as a rock is left in contact with the earth for any length of time moisture is retained at the surface of the ground directly beneath the point of contact. This is true with the solid floor slab of the exchange building. With moisture constantly present beneath the floor, the concrete becomes saturated by absorption.

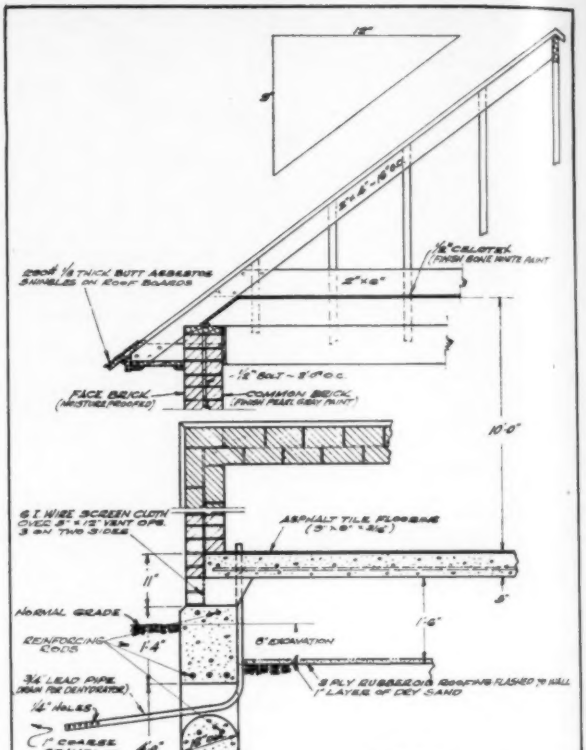
To overcome this second function of nature a suspended floor slab should be provided. The foundation walls should be equipped with vents to provide ventilation below the floor. This is to assist in the control of vaporized earth moisture from condensing on the under side of the floor slab, and by absorption reaching the interior of the building. A further precaution is the practice of sealing off the grade beneath the building with 30-pound building paper, flashed to the side walls with tar, and covered with a topping of one inch of dry sand. In this manner each moisture will not vaporize and cannot reach the floor slab.

Roof design and construction should be carefully considered and the proper type decided upon to meet the climatic conditions in the area to be served.

A cottage type, or hip roof, is best suited for areas with heavy snow loads. The roof should be pitched at a sharp angle to shed snow and eaves should be omitted entirely to avoid the accumulation of ice during thaws. This ice accumulation will warp eaves and shingles and cause leaks. Shingles should be of

Engineering Library


TELEPHONE
HOLE TO BE NOT LESS THAN 8'-6" DIA. AND 7'-0" DEEP. HOLE SHALL BE AT LEAST 5'-0" INTO PERMANENT LY MOIST EARTH. IN EXTREMELY COLD CLIMATE THE DEPTH OF THE HOLE SHALL BE SUFFICIENT TO LOCATE THE GROUND PLATE AT LEAST 2'-0 BELOW FROST LINE.
GRADE
SEALED JOINT
3/4" LEAD PIPE
NOT LESS THAN 4'-6"
6" TO 24"
NOT LESS THAN 7'-0"
COPPER PLATE
54"
#4 B & S GA. BARE COPPER STRAND
BRAZED SPLICE
TERMINAL LUG (BRAZED)
RIVETED & BRAZED
NOTE: ALL CONNECTIONS AND WIRE UNDERGROUND TO BE HEAVILY COATED WITH ASPHALTUM PAINT. THIS DOES NOT APPLY TO COPPER PLATE.
1'-0" x 10'-0" #4 B & S GA. SHEET COPPER
C.O. GROUND
UNATTENDED EXCHANGE BLDG.



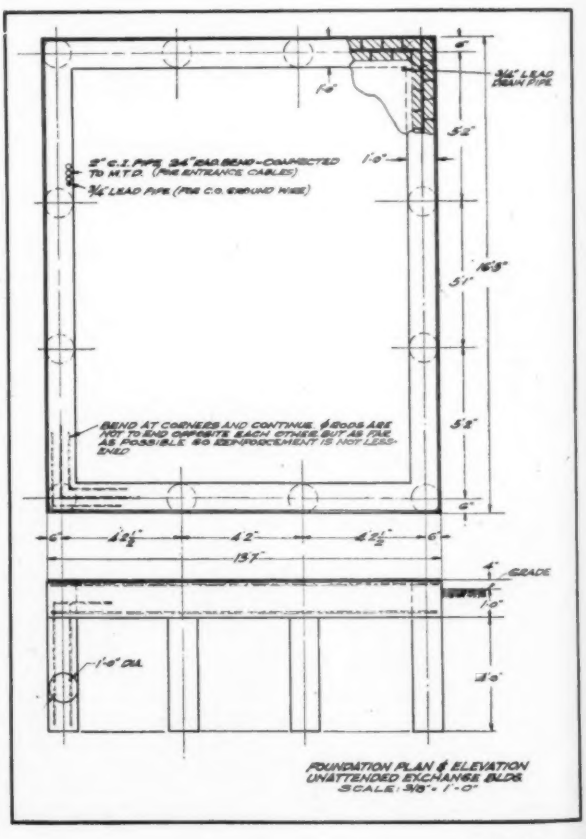
the asbestos type to insure fire protection. Other types of fire resistant strip shingles are suitable, but do not offer the complete protection of asbestos.

It is recommended that a cottage type roof be specified on buildings constructed in sparsely settled areas where the possibility exists for prairie or forest fires, and in congested building areas where fire hazards exist. In these cases a much steeper angle on the roof is necessary so that fire brands will be shed more rapidly. Asbestos or slate shingles in these cases should be a must. Eaves should be eliminated to avoid fire along the side walls from entering the building. When steep angled roofs are provided special attention should be given to their anchorage at the junction of roof and masonry walls, as with this type of roof the effects of wind pressure are increased considerably. A good plan to follow is the insertion of one-half inch iron rods at each corner of the building extending from foundation walls through the roof plates.

A building of the cottage type roof may also be used in mild climates if this design will more favorably meet the surrounding architecture. In this case it is recommended that wide eaves be specified as they have a tendency to reduce in appearance the height of the building.

When a wooden frame roof is specified all junctions with the masonry walls should be well caulked, also the door frame, to prevent the entrance of insects.

Flat type roof construction should be avoided in heavy snow country. If it is necessary to specify this type it should be of the cantilever design that completely omits the need of parapet walls. Snow and ice accumulates on a flat roof and if parapet walls are present the expansion and contraction of this snow and ice will ultimately weaken these walls, crack the roof flashings and destroy the bond between the roof and the walls. Serious leaks will result.



Flat roof designs should be confined to the mild climate areas.

Unattended exchange buildings should be constructed initially for the anticipated ultimate equipment requirements rather than to plan an extension for some future time. Of course, I wish to qualify this statement by placing a limitation of 400 lines on the size of exchange considered.

I believe the vast majority of unattended exchange buildings now in operation, or planned for future conversions, are of 200 lines or less. Assuming that 200-line ultimate exchange requirements are in the majority we will consider a building of this size to determine the specific details of construction.

A composite floor plan showing equipment space requirements indicates that a building 12 ft. wide by 15 ft. long by 10 ft. high (clear ceiling) will accommodate 200 lines of dial equipment regardless of make.

To construct such a building, say in the northern part of the state of Michigan, the specification would read somewhat as follows:

Foundation and Floor

The foundation wall thickness should be one foot. Instead of the conventional method of building a solid foundation wall to the depth of frost level, this wall will be 1½ feet of reinforced concrete, four inches of which will extend above grade. This frame will be supported by 12-in. diameter, reinforced concrete piers, four on each side of the building. These piers are four or five feet long, depending on soil conditions and frost penetration.

This type of construction eliminates costly excavation, concrete forms, 60 per cent of materials and 75 per cent of the labor normally required for foundation construction.

The floor should be of reinforced concrete five inches thick and suspended 15 ins. above normal grade. There is an excavated space of 18 ins. under the floor for the purpose of ventilation.

Wall Construction

The exterior walls should be of face brick, backed up with common brick. They may be either of solid or cavity construction, eight inches thick. Because of the 10 ft. clear ceiling heights required for certain types of equipment, offset courses of brick for exterior trim may be desired. Bricks laid as soldier courses at base and top of walls, or as quoins at the corners, projecting three-quarters of an inch will give the illusion of less height, and will produce an improved balance of appearance.

Roof Construction

The roof should be of the hip type construction. The rafters of 2 ins. x 4 ins. boards, placed 16 ins. on centers, set to a pitch of 9 ins. in 12 ins. will provide the framing for a roof that is practical as well as pleasing in appearance.

On this framing place one-inch thick roof boards laid tight, and cover them with 30-pound asphalt saturated roofing, also 290-pound one-eighth inch thick butt, asbestos shingles. Approximately four squares (10 ft. x 10 ft.) are required.

Left to right: A. E. HENRY, Princeton, Ill.; R. E. HENRY, Ka-Mo Tools, Inc.; C. M. BOWLING, Kellogg Switchboard & Supply Co.; ED REEP and N. C. SACKETT, both of Ashland, Ohio, and CHARLES KANDEL, Ka-Mo Tools, Inc.

Windows

Windows should be omitted. There is no need for natural light in the interior of the building.

Door

The door and frame should be of the Kalamine type, size 3 ins. x 7 ft. x 1¾ ins. This door and frame are metal covered, over a core of wood. The door is hung to swing out, which reduces space requirements within, and more effectively prevents dust from entering the interior.

Interior Finish

The common brick walls are given two coats of light gray paint. The ceiling of one-half inch Celotex or equal material is painted with two coats of flat white paint. All paint used must be free from turpentine and other volatile oils, as such are harmful to the switching equipment.

The floor covering should be either three-sixteenths of an inch battleship linoleum or the same thickness of asphalt tile of 9 ins. x 9 ins. squares. The latter is preferred as damaged or worn tiles may be replaced without disturbing the remaining area.

Switchroom Lighting and Power Outlets

The lighting should consist of three 100-watt ceiling outlets; one controlled from a switch at the left of the building entrance. Two are provided with pull type sockets. Two double convenience outlets are provided, equipped with pilot lights and mounted one on each side wall. One separate outlet for charging equipment is furnished. These three types of circuits are fused separately. The commercial current meter is mounted on the exterior of the building.

Central Office Ground

The central office ground wire of No. 0 B. & S. gauge bare copper strand should be attached with terminal lugs brazed to a copper plate electrode. This copper plate is one foot wide and 10 ft. long of 14-gauge, wound in a smooth spiral, to an approximate diameter of two inches. The top of this plate is set in the earth to a depth necessary for it to be in contact with constantly moist earth. The plate is surrounded by a cubic yard of coke to assist in the retention of moisture.

Heating

No means of artificial heat should be provided. When heating facilities are omitted in an unattended office located in a cold climate, it is usually recommended that the equipment battery be specified with approximately 25 per cent additional capacity than would normally be required. This additional capacity will compensate for the loss in efficiency while the battery operates at low temperatures.

I might repeat, that a building of this size, constructed to the dimensions given above, will accommodate any make of equipment now offered by the manufacturers, where the ultimate of line and trunk requirements do not exceed the capacity of a 200-line switching unit.

This is important, as it permits the building construction program to proceed independently of the equipment engineering and delivery. In this manner sufficient time can be scheduled so that the structure will be thoroughly free of moisture, introduced by construction methods, before the equipment is installed. This period is usually determined by local weather conditions at the time of completion, but usually 60 days will be sufficient.

On the present day market this building, finished complete, including grading, will cost approximately $1,900. In 1940, the same building was constructed for $1,400, an increase of 36 per cent under today's prices.

PROTECTION AGAINST LIGHTNING

By G. W. MILLER

Chief Engineer
Rochester (N. Y.) Telephone Corp.

IN ANCIENT days, men believed that lightning was a bolt of fire hurled at the earth by an angry god—and, indeed, when we see the sky filled with blinding flashes, and hear the crash and roll of thunder, we readily can understand how they came to entertain this belief. Modern science, however, has dispelled the mystery.

We know now that lightning is caused by electric charges generated upon countless water drops when air currents churn them about inside a thundercloud. The process resembles the common experiment which produces "opposite" charges of positive and negative electricity by rubbing certain objects together. Such charges, once they have been set up, attract one another. If they are strong enough, they break down the resistance of the intervening air and rush together. Then we see an electric spark or flash. Lightning is such a flash on a gigantic scale.

Although scientists do not agree on the details, the electrical discharge does make the air molecules along its path glow in a manner similar to the glow in a neon tube. This is what we see when lightning flashes. The accompanying thunder probably heats the air until it "explodes." Echoes from clouds add the "roll." Many people dread thunder even more than the lightning, but the flash is over by the time we hear the thunder.

In an average year, lightning kills some 400 people and causes some 20 million dollars worth of damage in the United States. Lightning, we know, seeks the shortest path between its parent cloud and the ground. Church steeples, flagpoles and lone trees provide a short path, and lightning tends to strike them. Hence, we should stay away from them during thunderstorms. Persons on mountain tops or on level plains should lie down. People inside buildings are relatively safe, for lightning usually travels down the outside of a building or along water pipes or other metal paths. Steel-framed skyscrapers especially are safe, for they act as giant lightning rods.

As we know the lightning rod was invented, or should I say suggested, by Benjamin Franklin after his memorable experiment in June of 1752, when he flew a silk-covered kite surmounted by a pointed wire to collect the electricity during a thunderstorm. The wet kite string, conducting the electricity, was insulated from his body by means of a length of dry silk ribbon, and a door key was suspended at the end of the wet string. Soon electricity was conducted downward, so that when Franklin brought his knuckle near the key, a spark flew out. On that June day, he collected enough electricity to charge a Leyden jar, and his later experiments proved that it was, in all respects, the same electricity produced by friction.

G. W. MILLER

Central office equipment, and its associated wiring, is designed to operate, within a fair margin of safety, with the currents and voltages common in the operation of the telephone system. It would be very impracticable to build plant to carry sudden high surges of voltage or current from outside sources, such as lightning. Hence, it is necessary to provide protective devices, such as fuses, heat coils and protector blocks which will prevent these high surges from damaging the plant and injuring the personnel. In the time allotted, I will endeavor to cover some common cases which always present themselves.

After either aerial or underground cables enter the central office building, the sheaths of all such cables are bonded together and the bond connected to ground, as shown on *Fig. 1.* This ground generally is the main central office ground, which is, if possible, the combination of a buried ground and a connection to the water pipe on the street side of the meter, or, if that is not possible, a bond is placed around the meter.

At this point, I want to say a word regarding grounds. Typical grounding connections are water pipes, buried copper plates and driven ground rods of various types. Telephone companies require many driven ground rods in their systems, especially in the suburban and rural areas where water pipe grounds are not easy to obtain at all times. It always is the object to obtain a consistent and reasonably low value of ground rod resistance. Increasing the length of the rod has a greater effect on the reduction of resistance than increasing the diameter.

The resistance of the soil decreases with depth below the surface, due to increased moisture content. Sudden changes in the type of soil also may be found, resulting in abrupt changes in resistance. If permanent moisture level can be found, the rod resistance usually will be low and will remain low. In many localities, it is difficult to drive a rod to permanent moisture level, and when a low value of resistance is required, either two or more rods or pipes must be driven and connected in parallel series or both. Of course, the best grounds are obtained in wet, marshy soils, then, in increasing resistance, the clay soil comes next with its variations, damp sand, dry sand and, finally, gravel and stones.

The soil resistivity may be lowered by adding to the soil some chemical which is highly conductive in its water solution. Many chemical salts could be used, such as common rock salt, which is the least expensive and most readily obtainable, also copper sulphate and zinc sulphate. All of these salts should be used at least 12 ins. from the rod to prevent corrosion. It is very enlightening at times to find out just how good or bad a ground happens to be. One instrument which can be used to determine the ohmic resistance of a ground is the megger. In this instrument, a hand generator furnishes alternating current to the ground under test, which returns by the way of auxiliary ground rods. Stray AC or DC voltages do not affect the reading, which is given directly in ohms.

In addition to the public water system, it is permissible to use the public gas system provided there are no local restrictions and, there again, the ground connection should be made on the street side of the meter or at the point the gas pipe enters the building.

A private water system also can be used, provided the system does not use wells or cisterns. If a grounded metallic structure is available and it is of a permanent nature, it will make a good ground; these will include such items as pipes, tanks or conduits.

Care should be taken, on installing the ground wire run, to see that it is as short as possible and yet secure and safe. Foreign conduits and pipes, particularly those used in commercial power and light supply, should be avoided and if they are close together, a minimum clear distance between the two should be at least three to four inches.

The National Electrical Code specifies in Section 8022 that "A separation of at least six feet shall be maintained between signal and control conductors on buildings and lightning conductors." Also in Section 8031-b-5, the code specifies that "Steam or hot water pipes or lightning rod conductors shall not be employed as electrodes for protection." It is recognized that sprinkler systems also should be included in that category.

Considering first the case of an aerial cable entering the central office building, as indicated in *Fig. 2* and *Fig. 3*, with and without a section of protective cable of at least six feet of 24 gauge or smaller conductors.

When line or drop wires are extended into the central office by rubber insulated bridle cable, the protection should be as shown in *Fig. 4*.

Next we consider the underground or buried cable entering the central office and extended by aerial cable, with and without a section of at least six feet of 24 gauge or smaller conductors of protective cable, as drawn in the *Fig. 5* and *Fig. 6*.

There are cases where the block wires are in exposed areas and the block cable is in an unexposed area. The protection should be at the point where the wires enter the cable, as shown in *Fig. 7*.

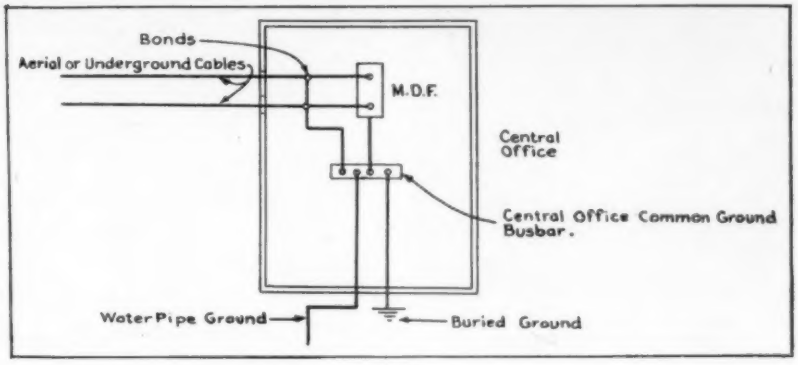


Fig. 1

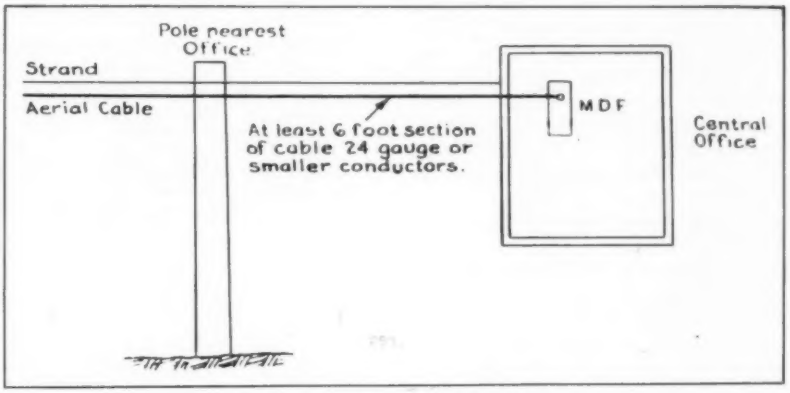


Fig. 2: With section of protective cable.

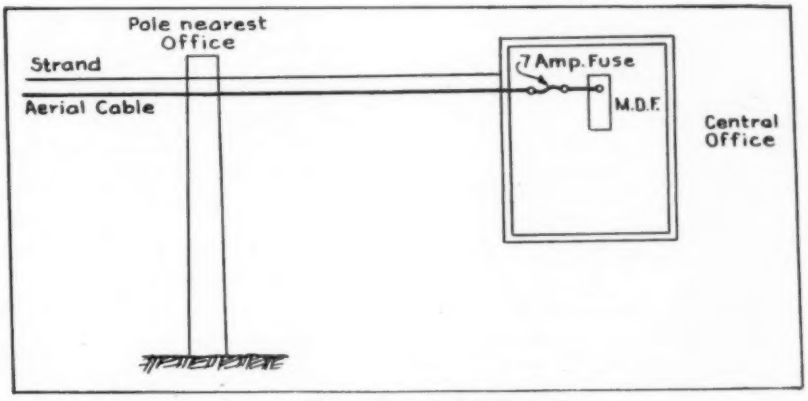


Fig. 3: Without section of protective cable.

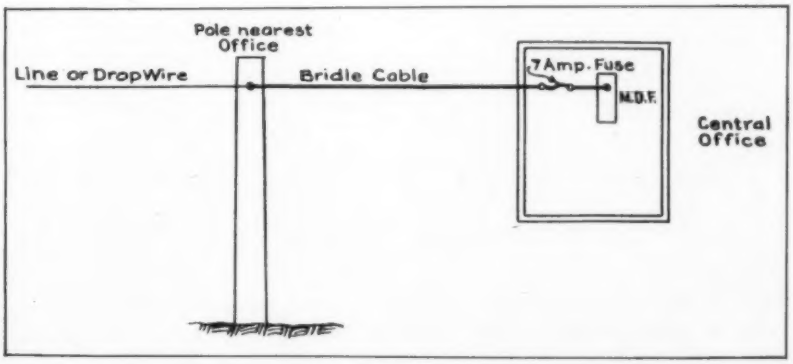


Fig. 4

Short Story

"Injury," said the workman.

"Inattention," said the supervisor.

"Inflammation," said the doctor.

"Incurable," said the hospital.

"Incredible," said the mourners.

"Interred," said the undertaker.

"In Peace," said the tombstone.

—*Safety Engineering.*

J. V. ROBINSON (left) and J. C. BARTLETT of the Acorn Insulated Wire Co.

In the case of an underground cable serving exposed blocks, the protection should be at the junction of the two cables.

A slightly different case presents itself where an underground or buried cable is extended by drop or line wires. Protection should be furnished, with and without the protection cable, as indicated in *Fig. 8* and *Fig. 9*, at the point where the exposed wires enter the cable.

The following treatment, *Fig. 10*, should be used when line or drop wires enter an aerial cable.

A good rule to follow is that when one or more lines at a given terminal require protector blocks, they should be placed on all wires at that terminal. Protector blocks also should be used on all lines over one-half mile in length.

In case it is necessary or desirable to provide an underground service connection to a subscriber's building, the junction between the open wire and cable should be protected by protector blocks with a protector inside of the building. The outside protection may be omitted if the cable length is less than 300 ft. and the open wire is less than one-half mile in length.

When line or drop wires enter underground, aerial, buried or submarine cables, and the lines are more than one-half mile in length, the protector blocks should be placed around the cable terminals. Here again, if one or more lines at a given terminal requires protector blocks, they should be placed on all lines.

In the case of interoffice trunk cables which have no exposure or are completely underground, with no outside terminals, it is the practice to omit all protection on such cables, including protection inside the central office.

This discussion would not be complete if the subject of protecting poles was not included. In general, poles are protected only from lightning in sections where severe electrical storms occur at certain seasons of the year, and damage might result if no protection were provided. The protection wire

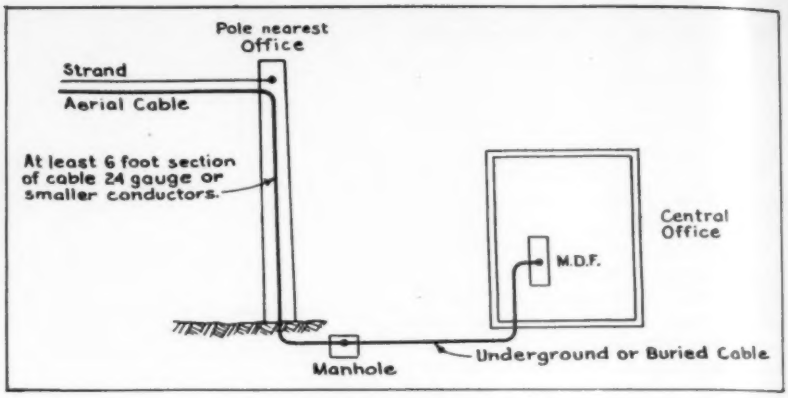


Fig. 5: With section of protective cable.

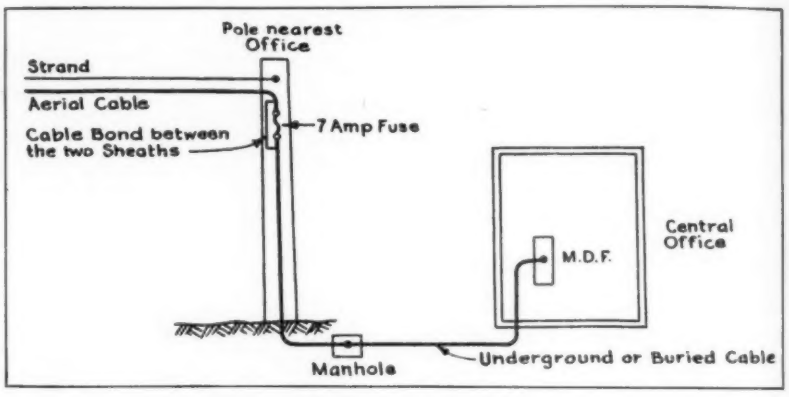


Fig. 6: Without section of protective cable.

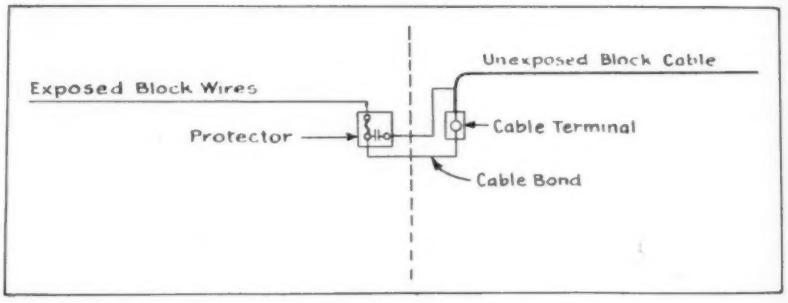


Fig. 7

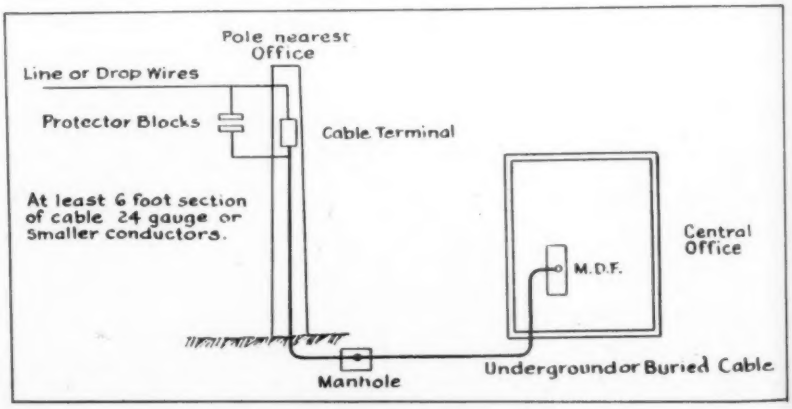


Fig. 8: With section of protective cable.

is mounted directly across the roof of the pole; one end is fastened about two inches below that mounting, and the other end is brought down the pole, clearing crossarms and other attachments. If the pole is carrying wire only, or carrying cable and not accessible from the ground, the end is cut off and made into a U about two feet above the ground line.

If the pole is carrying cable and is accessible from the ground, a one-foot gap in the wire about seven or eight feet up the pole should be made and then the continued part of the wire pushed at least a foot into the ground.

The protection wire should be connected to a convenient portion of the hardware used in attaching the suspension strand. If this hardware is used in attaching the guy to the pole and is within about 18 ins. from the top, no protection wire is required. If, however, this hardware is more than the 18 ins from the top, a protection wire might be used, terminating about four inches above this hardware. The gap is provided in the ground wires so that a man working on the open wire will not be connected to ground through the ground wire and so that aerial cables will be free from scattered ground connections. Experience has shown that lightning will discharge over the ground wire even though there is a gap in it.

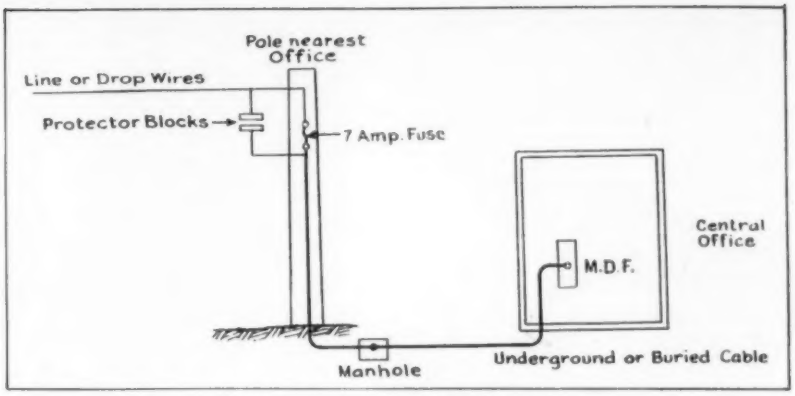


Fig. 9: Without section of protective cable.

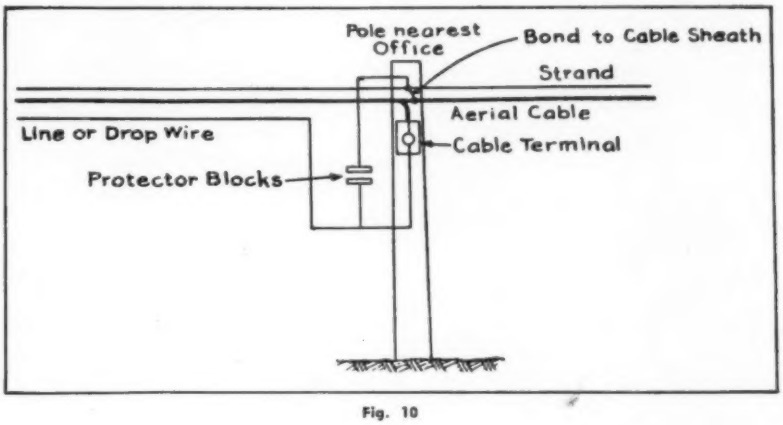


Fig. 10

No Wonder That Line Is Busy!

ACCORDING to "Encyclopaedia Britannica's 1946 Book of the Year," about 104,000,000 local telephone calls were made daily in the United States in 1945. This information is all right as far as it goes—but what I'd like to know, as a student of human foibles, is what classifications did these phone calls fall into?

Here is the way I have doped it out, eliminating all wrong numbers, drunks who call city desks, lewd men who dial numbers scribbled on telephone booth walls, and such:

12,500,000 calls—Young wives telephoning their mothers to tell them the new word Junior learned today.

14,625,000 calls—Mothers telephoning their married daughters to inquire what new words Junior used today.

4,888,762 calls—Businessmen making luncheon appointments.

4,888,762 calls—Businessmen breaking luncheon appointments.

7,491,062 calls—People trying to get hold of baby-sitters.

10,684,552 calls—High-school students comparing Perry Como recordings.

11,518,000 calls—High-school students comparing Frank Sinatra recordings.

2,643,342 calls—What horses have been scratched in the fifth at Pimlico?

3,600,219 calls—People who were out, returning your call, at a time when you are out, and finally you both give it up as a bad job, with the feeling there was nothing important to say anyway. And there wasn't.

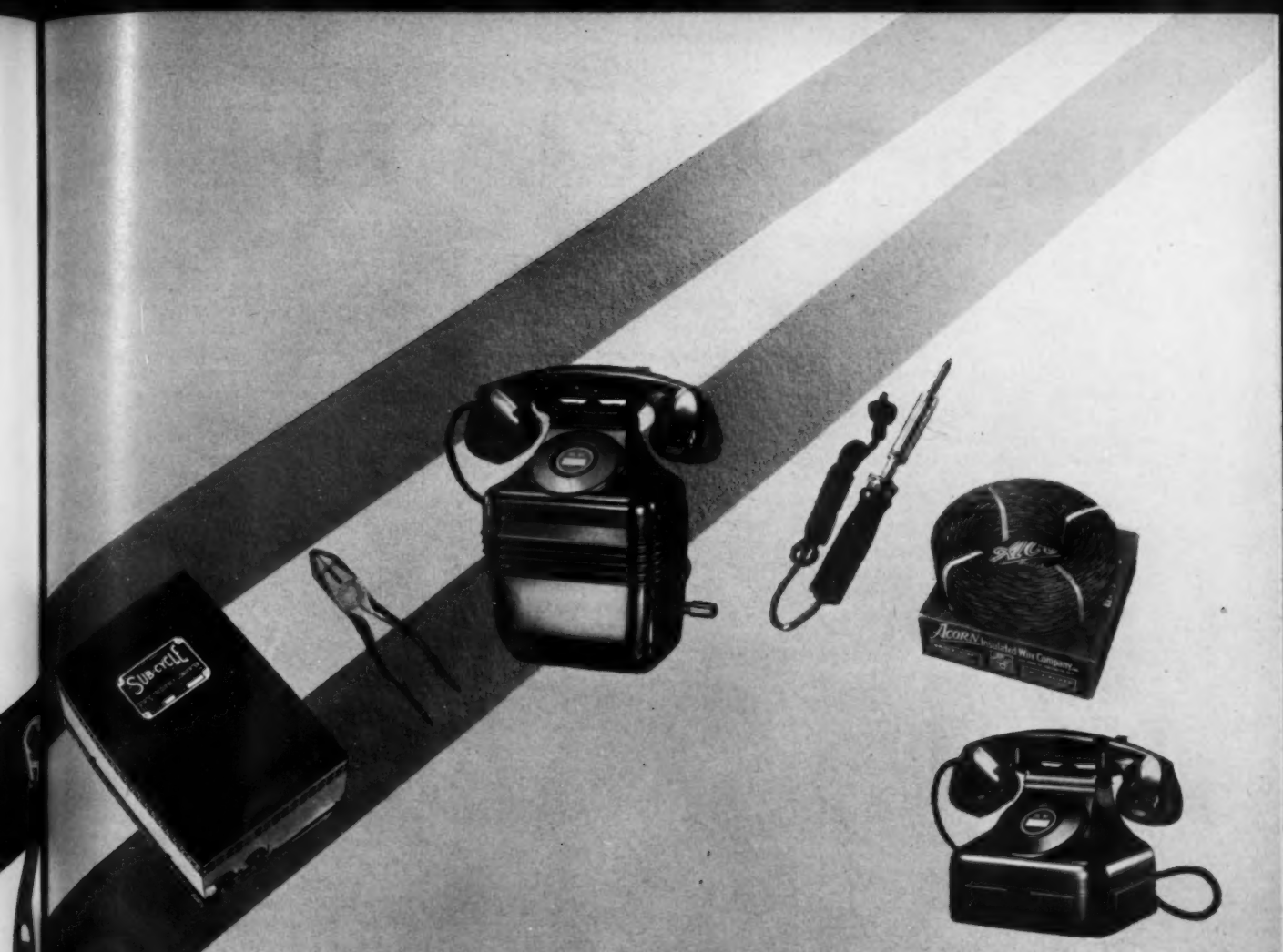
9,500,212 calls—What times does the main feature go on at the Bijou?

16,717,982 calls—Hello, honey, I won't be home for dinner tonight—and don't wait up for me.

That slight rumbling you hear, of course, is Alexander Graham Bell turning over in his grave. And who can blame him?—**Sydney J. Harris in Chicago *Daily News*.**

>> *More than 15,000 Bell Telephone System teletypewriters serve business houses throughout the nation. This service first was offered to the public 15 years ago. Through teletypewriter switchboards, as through telephone switchboards, it is possible for any teletypewriter subscribers to be connected quickly to any other at any point in the country.*

LEICH



IT PAYS TO CHECK WITH LEICH

Here's some things you might like to know about the Leich organization. First, of all, Leich has been making switchboards and telephones since 1907. Right now, there are more Leich telephones and switchboards, both common battery and magneto, in use than ever before. Which is pretty good proof that we've continued to develop and invent and improve Leich equipment—so that it will pay any telephone man well to see what Leich equipment can do for him.

If it's supplies and construction materials you need, check with Leich on that too. We carry a complete line of telephone supplies, made by manufacturers well-known to the telephone industry. You may find our cooperation very useful in helping you get things done under today's trying conditions.

We can't brag about super-fast service —(who can)—but a lot of good telephone men tell us we've been a big help to them and have done better than they thought we could. If you'd check with us on your current needs we'd be very glad to see what we can do . . . for you.

UFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

TOOLS; TESTING INSTRUMENTS

By RAY BLAIN
Technical Editor
TELEPHONY

'WAY BACK when, in the telephone industry, an installer or troubleshooter could just about perform any task with a pocket knife, screwdriver and a pair of pliers, testing instruments practically were unknown. Actually, he had very little choice in the matter for those were about the only tools then available so he was forced to do his best with what was to be had.

Medical history informs us that the old time surgeon also had few instruments and often operated on an oil-cloth-covered kitchen table by the aid of a kerosene lantern. The operation usually was a success, but often the patient died. The present-day surgeon, with his numerous instruments and modern appliances, effects miraculous cures which were considered impossible only a few short years ago.

Likewise, modern telephone workers, not only because they are better trained, but also by the aid of numerous tools and testing instruments, now can do a better job in much less time than was possible by the poor old wire tanglers in the early days of our industry.

Because some of you may not be thoroughly familiar with many of the latest tool developments and their applications to telephone work, I shall attempt to describe a few of them and indicate, in general, their outstanding advantages. Some of you probably will not agree with all I have to say regarding certain tools or their features and that, of course, is your privilege. I will say, however, that the features described and recommended have been obtained from actual tests on the job by practical telephone men who consider these tools worthwhile and of considerable help to them in their daily work.

Soldering

You will all agree that soldering is a most important function in any telephone exchange. Properly performed, it will prevent (or improperly done, it will cause) more trouble than any one single work operation. Solder is necessary to produce a low resistance, permanent bond between metallic parts in an electrical circuit. Seldom is the mechanical strength of solder an important consideration since the parts joined with solder are held together mechanically. The sole function of solder is to seal the connection against the entrance of moisture and air and to prevent oxidization and corrosion and to maintain a low-resistance electrical connection between the parts joined.

Heat must be applied to the connection so that the temperatures of the parts are elevated to soldering temperatures. This may be accomplished in numerous ways. Soldering coppers may be heated by an open gas flame from a furnace or a blowtorch. This method, if properly used, is satisfactory for certain types of work, but is rather slow and cumbersome and often proves unsafe. The resistance method proves entirely satisfactory for some types of soldering, such as making repairs to small openings in cable sheath. With this method, intense heat is generated by an arc between two carbon electrodes or between one electrode and the part to be soldered. The rate of heat is controlled by the amount of flowing current. Induction heating, where the parts are heated to soldering temperatures by induced high-frequency currents, is used extensively in manufacturing processes, but is not at the present time applicable to general telephone work in the exchange or out on the line.

RAY BLAIN, TELEPHONY's popular technical editor and photographer at the USITA convention, addressing the plant conference.

Electric soldering irons have been used extensively and successfully for years in the telephone industry and provide a convenient means of heating the copper. Since the heating element is mounted in the iron itself, all heat generated is used and the only loss is from radiation, which is slight. Modern electric soldering irons are available with built-in thermostatic controls so that overheating is prevented. Various iron designs and tip shapes are available which are especially suited to numerous telephone jobs. There is no doubt that this type of heating device is best suited to soldering on a production basis, such as soldering 30 or 40 connections when connecting a jack strip in a manual switchboard.

The Speed Iron

A new type of rapid heating soldering iron recently was developed and placed on the market which ideally is suited to certain kinds of telephone work. Instead of using a heating element to heat the copper, the soldering is performed with the heating element itself. This element consists of a single turn of copper wire which forms the secondary of a small step-down transformer mounted in the pistol-grip handle. This device operates on the same principle as the resistance welder, a high current and low voltage which generates high heat almost instantly. Full soldering heat is available in five seconds. There is no waiting for an iron to heat so that a workman can solder a jumper on the main frame or open a connection on a coil or a relay when chasing a case of trouble.

Just release the trigger when through soldering and the element coils instantly. The tip stays tinned for long periods without cleaning. This wire tip also can be bent and formed to meet almost any special soldering requirement.

Thermal conductivity of wire or cable being soldered often chars and frays the insulation. The best method known to overcome this thermal conductivity is to heat the part at such a rapid rate that there is little time for thermal flow. This new "pistol-grip" speed iron does just that and the danger of burning wire insulation practically is eliminated altogether.

Wire Strippers

Telephone men, in general, never have taken kindly to wire stripping tools. They usually claim that they can do a better and faster job with a pair of notched pliers. The trouble, however, with this makeshift is that frequently the wire is nicked, later causing it to break and the result is a case of trouble. Personally, I always have thought too much of my pliers to

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THAT NEVER GIVES UP
ALONG THE FROZEN ALASKA MILITARY HIGHWAY
THROUGH THE STEAMING JUNGLES OF THE SOUTH PACIFIC

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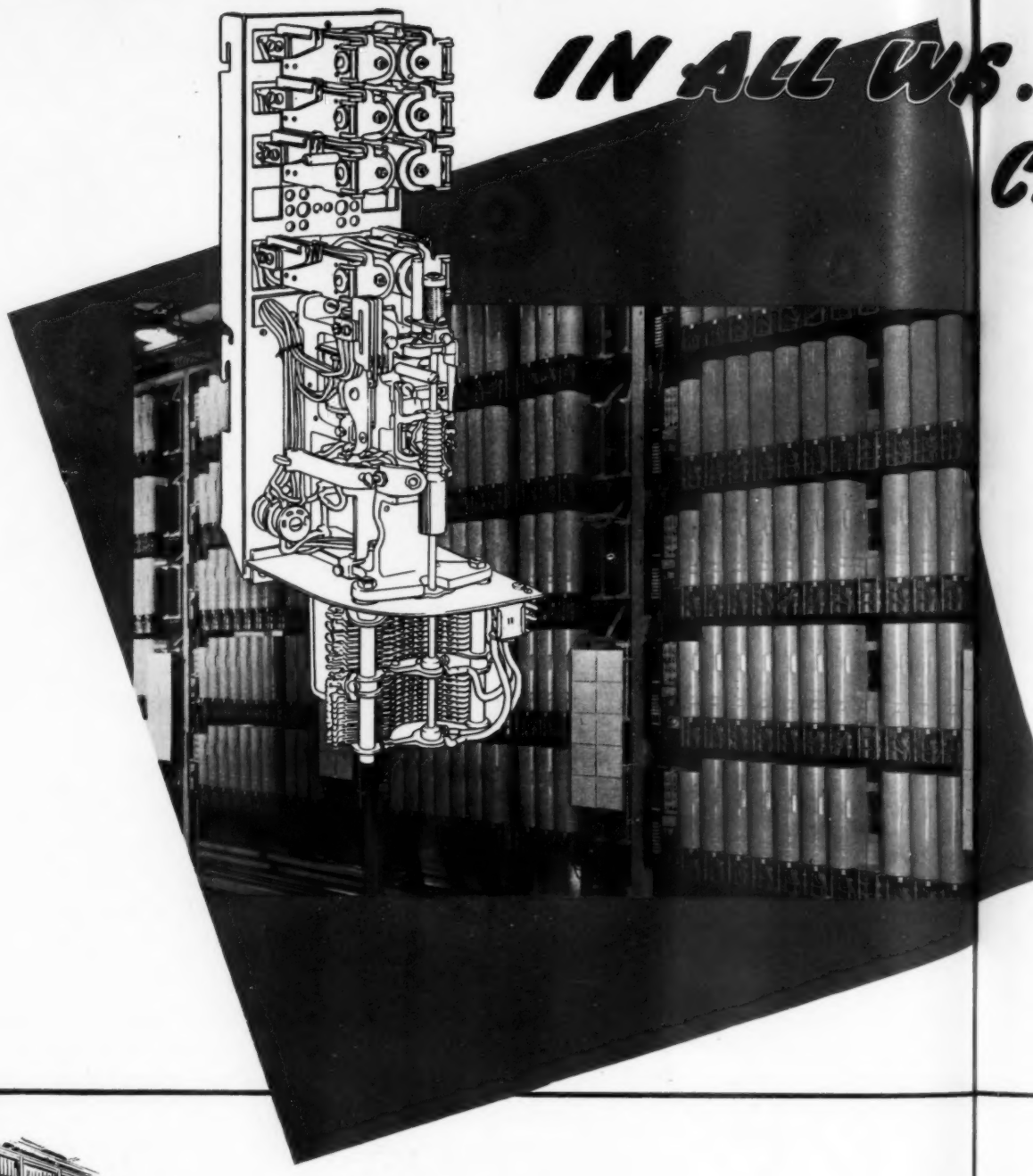
Copperweld Telephone Products

COPPERWELD STEEL COMPANY, *Glassport, Pa.*

Sales Offices in Principal Cities



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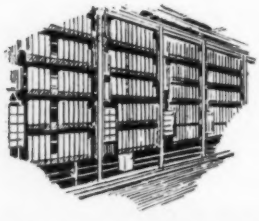

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In the small community exchange it serves as the entire operating staff — automatically completing local calls, and directing toll calls to the operator at a distant attended exchange. In town or city it meets all operating requirements in exchanges of any size — including private branch exchanges. In toll switching, it speeds up service, improves toll-line efficiency, saves operating costs: it offers all facilities needed in the most comprehensive automatic toll networks — including the Strowger Director for register-sender-translator-operation.

Shown below are a few of the ways Strowger Automatic equipment might help you. Take a moment to read about them — and then ask the Automatic Electric representative (or write us) for complete information about any or all. You will be glad to know just exactly what Strowger Automatic can do for you.

ALL TELS:

UIPMENT
toll-dial
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AUTOMATIC ELECTRIC

Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . Machine Switching Automatic Dial Systems
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ruin them by cutting a notch in the jaws.

The new "E-Z" automatic wire stripper is the first tool of its kind which I feel has proved worthy of service in the telephone field. Operating like a pair of pliers, it has a triple, but automatic action. When you press the handles, it first clamps the wire firmly, then neatly cuts the insulation all around the conductor, finally slipping the insulation off over the end of the wire. These three separate and distinct operations are accurately timed and performed in proper sequence with one squeeze of the handles. The cutting blades are interchangeable by removing two screws. One set of cutting blades is arranged to fit six different sizes of wire. In this particular model, one side takes 10, 14 and 22 gauge, and the other 12, 16 and 20 gauge.

This little tool will strip the insulation from either stranded or solid wire with equal ease and speed. It is ideally suited for use with plastic insulated wire which now is coming into general use and is proving extremely popular in the telephone field. This stripper will be found suitable for use with most types and sizes of wire used in telephone work. Its use will not only save time, but also will eliminate nicks which eventually will mean broken conductors and opens.

Left to right: C. A. SWEET, Belle Plaine, Kan.; A. J. KOHN, Schauer Machine Co.; PAUL THOREN and ROSS BYRON, both of Chicago; R. C. WICKERSHAM, Tipton, Ind., and HOWARD BERSTED, Leich Sales Corp.

Left to right: R. M. SANDERS and R. J. KELLER of Runzel Cord & Wire Co.; W. C. SNYDER, R. L. HEPNER and R. T. SNYDER, all of Buckeye Telephone Supply Co.

Nico-Tap Sleeves

I am sure you all are familiar with and have probably used Nicopress splicing sleeves for line wire. These sleeves were used on the now famous telephone line along the Alaska Military Highway on the Copperweld line wire and really have proved their worth. There have been, to date, very few cases of actual line trouble on this lead. This line, built during the war, has taught telephone engineers more about open wire line design in three years than they ordinarily would have learned in 100 years by the usually slow and easy method. Undoubtedly, you are familiar with and have used the Nicopress deadend and the smaller sleeve and tool for splicing drop and inside wire.

There recently has been added a new and important item to this celebrated line, the Nico-Tap sleeve. In plain wire tangler's language, this is a half-tap sleeve which is split so that it can be set on the line wire instead of being slipped over it. It is compressed in place so that it stays there for all time. This tap can be used to connect a half-tap on line wire, a jumper wire to line wire, or a half tap on a drop wire. Also, two jumper wire taps can be made on line wire. This little trick is performed by leaving a long tail on the jumper wire and extending it through the Nico-Tap so that it can be connected to another jumper with a straight sleeve.

These tap connections can be made easily and quickly without any wire wrapping or soldering. Just set the Nico-Tap sleeve on the line wire and compress in place with four separate presses of the tool. Next, slip the jumper wire into the other end of the Nico-Tap sleeve, leaving one-eighth inch or more of bare wire between the sleeve and the insulation and repeat the pressing operation. There is no danger of injury to the galvanizing on the steel wire. Therefore, no rust and later corrosion of the connection will result in causing trouble, a thing which frequently happened when a soldered connection was used.

Pre-Insulated Sleeve

Splices in house wire often cause noise and transmission loss due to corrosion. We realize that splices of this nature always should be soldered, but we are in a hurry sometimes and often this small, though important, detail is neglected. There now is available a compression type splicing sleeve for this job which is pre-insulated. The wire merely is slipped into the sleeve which is then compressed and the splice is complete. There is no need for a tape covering as the sleeve is insulated with a corrosion-proof plastic material. The high pressure crimping unites wire and sleeve barrel in a homogeneous mass and the connection is moisture-proof. The tensile strength of the splice is well above that required for splicing wire of this type and much stronger than a wrapped soldered connection. It also is much neater.

Various types and sizes of both ring tongue and spade tongue terminals are available. These terminals can be crimped on both solid and stranded wire. The smaller terminal of the ring tongue type can be used to advantage on cords or test leads. The larger sizes can be used on all kinds of power wiring. It often may prove advantageous to crimp these terminals on house or jumper wires for use in attaching to a punching in a terminal. Certainly, this is a more convenient and satisfactory method than wrapping the wire around a post and tightening it down under a nut.

Cable Strippers

The old time cable splicer was content to use his chipping knife and hammer to remove the sheath from lead covered cable. He was a master at this, but even so he frequently misjudged the depth of the cut and injured the conductors. The Jones' cable stripper, perfected by one of the Jones boys in a shipyard during the war, performs the work in connection with sheath removal, quickly and safely. Very little

The Telephone Booth *in full dress*

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The telephone booth can now come out of hiding. No longer is it necessary to exile it to some out-of-the-way corner. Here is a telephone booth keyed to the interior scheme of modern architectural designs. Available in colors and combinations of colors to harmonize with the decorative motif of any surroundings. Single or multiple units, these telephone booths are made to your specific requirements.

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- Equal-Leaf Folding Door
- Acoustically Lined (Sound-absorbing)
- Electric Ventilation

Our Telephone Booth Engineers are Available for Consultation

Sherron Metallic Corporation

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For the convenience of West Coast Companies, we are pleased to announce the opening of our SAN FRANCISCO sales office: Mechanics Institute Bldg., 57 Post Street.

training is necessary for a workman to use this new tool effectively in the removal of lead sheath.

Compression of the handles firmly lock the tool to the cable. The screw on the end of the handle adjusts the tool to various cable diameters. The wide saddle prevents gouging the sheath. The knife is reversible for longitudinal or transverse cuts.

The blade depth adjustment is for various thicknesses of lead sheath and prevents damage of conductors. There is no doubt but that all student splicers, as well as progressive old timers, should be provided with one of these new cable strippers and, if they will make use of it, this device certainly will prove a good investment.

Left to right: R. BAUMANN, Connecticut Telephone & Electric Corp.; DAN McNULTY, Telephone Repair & Supply Co.; H. B. RANDALL, Connecticut Telephone; R. W. STEVENS, Telephone Repair, and H. S. WALKER, Connecticut Telephone.

Testing

Too often, in their search for faults, troublemen work by instinct alone when their tasks could be made so much easier by the use of a few simple and comparatively inexpensive testing instruments. Contrary to the belief of many, the use of testing instruments to make the location of trouble easier is a most elementary operation. The simple, detailed instructions received with each instrument make its use by the man in the field a very simple operation. A few of the available testing instruments and their uses will be mentioned briefly.

There is a lineman's test set which has been on the market for a number of years which could be used to advantage by any company which operates open wire rural or toll lines. This set consists of a magneto tone generator, a finder coil, receiver, transmitter, test lamp and test key. It can be used to determine the direction of a short in a very simple manner.

The test clips first are placed on both wires of a metallic circuit and the finder coil clamped to one of the line wires. If a tone is heard when the crank is turned rapidly, the short is on the same side of the line clips on which the finder coil is located. If the tone is not heard, the finder coil should be moved to the other side of the line clips and the test repeated. If the tone can be heard on both sides of the line clips, there is trouble in both directions. In this event, the troubleman should go first in the direction of the loudest tone.

The distance to a short may be estimated by the use of the test lamp. This lamp will light if the line loop resistance is less than 600 ohms. The distance to the fault may be estimated by the brightness of the lamp. When the resistance is over 600 ohms, the lamp will not light, and the distance to the fault must be judged by the volume of the tone. The troubleman should move toward the fault and repeat the test until the trouble is located. If the trouble is passed, the tone in the receiver dies out.

This set also can be used in a similar manner to locate opens, grounds and crosses. It likewise is useful in the location of high resistance splices.

The voltmeter, with a suitable battery in series, may be used to advantage in making a variety of simple though effective tests in the location of various line troubles. This arrangement may be used to detect the slightest leak, either across the line or from either side of the line to ground. When the line is clear, only a capacity kick will be had as the voltmeter is connected across the line and reversed rapidly.

The voltmeter, with battery in series, may be connected across the line to detect a short circuit, or from either side of the line to ground to detect a ground leak. The voltmeter also may be used to detect foreign potentials on a line. The wire chief's test set is equipped with keys which make the various voltmeter connections, although this is not an absolute necessity as a portable meter and a dry cell battery can be used to make simple tests out on the line.

When using a voltmeter to measure resistance, the lower the resistance the greater will be the deflection on the meter. In all cases, the voltmeter reading has the same ratio to the voltmeter resistance as the difference between this reading and the test battery voltage has to the line resistance. Therefore, before making resistance tests, it is necessary that the exact voltage of the test battery be known.

The line resistance then may be determined by dividing the difference between the testing battery voltage and the voltmeter reading when connected to the line by the last named reading and by multiplying the result by the resistance of the voltmeter.

The ohmmeter is a simple instrument which reads resistance direct and which will be found accurate enough for general telephone use. It is small and convenient for a troubleman to carry out on the line. Various scales may be provided. For example, 0-10, 0-100, 0-5,000 and 0-50,000 ohms. The dry cell test battery usually is mounted inside the case. An adjustment for a variation in battery voltage is provided. This instrument may be used effectively to measure the resistance of a line, the insulation resistance between line wires or between line and ground.

To test for grounds, connect one lead of the meter to ground and the other to the line. The line can be opened at some convenient point in order to note whether or not the meter reading changes. The troubleman now proceeds along the line, clearing suspected ground conditions until the meter reads clear.

To test for shorts, connect the meter across the line affected and note the reading obtained. Similar tests should be made at other convenient locations along the line. Increase or decrease in resistance will indicate whether the troubleman is travelling toward or away from the trouble.

Whenever you have a need for more accurate measurement of unknown resistances, the old reliable Wheatstone Bridge always is recommended. While the bridge usually is considered quite complicated, in reality its principles and applications are quite simple. Briefly, these principles consist of matching the fall of potential across an unknown resistance, X, with the fall, across a known resistance, R. This matching is simplified by the use of a resistance A and B which together form a ratio, that is, 1 to 1, in which case the unknown resistance, X, equals the known resistance, R.

A simple transmission test set, consisting of a 1,000 cycle oscillator and a

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RADIO IN THE TELEPHONE FIELD

By E. H. B. BARTELINK

Radio Engineer
General Telephone System

IT MAY be said that during 1946 radio has taken a definite hold on the telephone industry. This may not yet be apparent from the number of radio installations now in use but it is borne out by the amount of interest shown, the number of active projects and their progress, and also by the number of new developments that now are under way.

There has not been one of these "landslides" which revolutionizes the industry overnight. This probably is fortunate because such radical processes often entail over-hasty action and necessitate retracing of steps already taken. Instead, there has been a steady development of existing and new techniques in the direction of making radio a useful tool for the telephone industry.

There have been some expectations that revolutionary events would result from application of the developments made in the field of microwave radar during the war. While these may be expected in the near future, it is well to remember a few facts in this regard. The bulk of wartime microwave developments were planned and used exclusively for military applications. In most cases, microwave energy was transmitted into enemy territory and reflected from there. These reflections were again received and interpreted by our equipment. There was a complete lack of cooperation at the distant end and this necessitates two-way transmission from a single transmitter which thus must have very high power-output. In peacetime telephone practice there will be a radical change because in that case the distant end will cooperate and one-way transmission of energy will be sufficient.

Thus, a period of reorientation and of redesigning of equipment was to be expected. In this interval the manufacturers would have to find out just what the requirements of the telephone industry are, as far as they can be determined, and then direct their development accordingly. In such a period the telephone companies can help the radio industry and themselves by attempting to get a clear analysis of their own future needs. Fortunately, at least the fundamental techniques and principles of microwaves now are well-known and provide sufficient basis for any developments needed in the near future.

Some of the microwave developments are farther ahead than others. Viewing the situation from the standpoint of the smaller telephone companies, it is unfortunate that the techniques which are farthest ahead provide fairly large numbers of circuits per transmitter while such large bundles of traffic account for only a very small fraction of the toll problems encountered in such companies. Developments on microwave equipment suitable for smaller traffic bundles is in progress and the economic aspects of such equipment seem very promising.

It should be noted that any initial units that might be available, probably will be produced on a "handmade" basis, so that the cost materially will be higher than for regular production units. It is to be hoped that telephone companies will not be confused by any high cost for such initial units, to the point where they fail to encourage these developments. If no risks are taken in the beginning it may be that the savings, which definitely seem possible with these techniques, will be long in coming through.

Different conditions exist in the field of very high frequencies (VHF). In this field, the radio equipment in existence at the end of the war was well adapted to the needs of the telephone industry as far as the straight transmission problems were concerned. Equipment which would span gaps of, for instance, 30 miles, was well developed and available. It is as a result of these developments that mobile radio has made such rapid and satisfactory progress.

In regard to point-to-point connections it seems that most of the single-channel equipment was developed for push-to-talk operation and that limited attention was given to extending such channels into a regular two-wire telephone system. While the technique needed here is the same as that used in terminating four-wire repeaters and, therefore, well known, there still is a need for a simple, reasonably priced, single-channel termination, adapted to telephone toll circuits.

Considerable work was done by the armed forces on the superposition of carrier channels on these VHF links. Such channels did provide terminations which would permit tie-in with a telephone system. While the cost problem may be neglected for military purposes, it is of extreme importance for a company that provides commercial service. For instance, it stands to reason that it does not pay to install carrier equipment if it is cheaper to provide a number of single channel links; this is the test that should be applied to any such carrier systems.

While a few words of caution have been voiced in some parts, the general future of radio in the telephone field seems very bright. This applies to the quality of performance that may be expected as well as to possible savings in operating expenses. It seems safe to assume that we will see plenty of action in the radio field at an early date.

After this general review some discussions will be given of the more specific fields where radio can be used.

Mobile Radio-Telephone

The object of mobile radio-telephone systems is to provide telephone service to cars, trucks, boats, etc., and thus to enable the occupants to communicate with an operator in the telephone office. From there the call can be extended to any subscriber who can be reached by existing facilities. Rapid progress has been made in this art to which the use of frequency modulation materially has contributed because of its capacity to provide noise suppression and an audio output level which is independent of the received RF signal strength.

There are two main classes of mobile service, the urban mobile and the highway mobile. The first is intended for customers who will, in general, be in their own city and surroundings. Under these conditions a fairly high frequency can be used and the Federal Communications Commission accordingly has set aside the frequency band of 152 to 162 MC. for this service. The highway mobile service is intended for customers who essentially do long distance driving, such as trucking lines, etc. In this service it is important to have larger coverage and because of this, frequencies in the 30 to 40 MC. band were assigned for this purpose.

In the New York - Albany - Buffalo system, it is intended to use one single frequency along the whole route. It is realized that problems such as overlap interference and long distance interference still exist. They could be avoided by assigning clear channels to each of the stations along the route. The operation of this single frequency highway system should be a valuable

help in determining the exact extent of such interferences. If they are small, as measured in circuit time, this method of proceeding will have helped to avoid the tying up of more of the few available channels and the necessity for more complicated equipment in the cars.

It may be noted that where the coverage of a highway system extends over a smaller city, which in itself would not justify the installation of an urban mobile system, service can be given to customers in that city by including them in the highway mobile system. If and when their number increases, a switchover to an urban system later can be made.

In the following, highway and urban systems will be discussed together, and references will be made for those remarks which apply to only one system.

The first commercial operation of this kind was the Bell System's urban mobile service in St. Louis where some 25 cars are equipped for this service. It has been found that waiting time already occurs during the busy periods. This should indicate that there is a definite need for this service, but also that problems of traffic handling capacity may be expected before long. While a complete review of planned installations is hard to give, some indication of the possible future scope of this service in the smaller companies might be obtained from plans of companies in the General Telephone System. In the immediate future these plans include two highway installations and three or four urban systems. A construction permit already has been issued for Long Beach, Calif., where equipment delivery has delayed initiation of the service. The FCC application for a highway station at Fonda, N. Y., is pending. This station will form part of the New York-Albany-Buffalo route of which the major part will be operated by the Bell System. The Upstate Telephone Corp. of New York will install and operate the equipment where the route goes through its territory.

Some information as to probable rates for this service may be in order. In the St. Louis area, rental and maintenance charges have been put at $15 monthly for a two-way mobile set. A $7.00 minimum service charge provides for 15 to 20 calls, originated by the car, of three minutes each in "general service." There also is a "dispatch service" which has the same minimum charge, for which 60 one-minute calls, originated by the car, are provided. Toll charges are normal but have a 45 cent minimum. These figures show that this is not a low cost service, at least at present. Reasons for this are the necessity to make ample provision for maintenance, particularly in the initial period, and the possible rapid obsolescence.

Left to right: W. L. RUNZEL, JR., and S. A. DUVALL, both of Runzel Cord & Wire Co.; E. E. ENGSBERG, Madison, Wis., and HARRY B. MacMEAL, Runzel Cord.

The technical results of the mobile service have been very gratifying. Good communication has been maintained even in such difficult territory as streets between skyscrapers. In such locations the energy reaches the street level by bouncing back and forth between buildings. In one interesting experiment in New York a car went from Park Ave. through the passage under the Grand Central Building, around the New York Central terminal, and through the vehicular tunnel from 40th to 33rd St. without any interruption of the radio reception in the car.

Equipment

It may be of interest to discuss some more details of a mobile radio system. The central office connects a subscriber to the toll switchboard where an operator has access to the radio channel through the central terminal which interconnects the main transmitter, the different "land receivers," and the line to the toll board. The car transmitters should be low power units in order to be economical, thus their range is smaller than the main transmitter coverage. Therefore, several land receivers are provided in the service area, and they are connected to the control terminal whenever their carrier relay operates on a received signal. The Vogad unit is a limiting amplifier which will operate on variable input levels, but feeds a nearly constant level to the main transmitter. Due to the limiting properties of FM, the output level of the land receivers is nearly independent of the received RF signal strength.

The control terminal also permits car-to-car conversations. If one car is transmitting, its speech is retransmitted by the main transmitter as well as being fed to the toll board, thus another car can receive it. Auxiliary equipment in a mobile system generally consists of: A frequency monitor with remote indication in the central office, a monitor receiver which checks that the main transmitter is indeed transmitting speech, and a test transmitter which checks whether the land receivers are operating by transmitting a signal on the car frequency.

The main transmitter generally has a power output of 250 watts and consists of a driver unit and a power amplifier. The driver unit generally is identical to the car transmitter, but has an AC power supply and is equipped for rack-mounting. The land receiver is similar to the car receiver except for the addition of a carrier-operated relay, AC supply and rack mounting.

Some remarks on possible developments may be in order. Most present receivers are equipped with a squelch circuit. An analysis made at General Telephone leads to the conclusion that this circuit can be eliminated completely in systems having selective calling. Another development may lead to the possibility of operating mobile systems in adjacent frequency channels.

Selective System

At this moment there are two major classes of selective systems in operation. In one system the dial directly controls a tone oscillator and transmits tone pulses corresponding to the digits dialed. The other system of dialing now in use transmits a sequence of pulses, each pulse consisting of one out of 11 different low frequencies. Each receiver has a certain combination of resonant reeds. If the proper sequence of low frequency tones is received, the reeds will close successive contacts and ring the alarm bell.

If only one radio-telephone system is used in a city, it is not very important which type of calling is used. If several transmitters are operated in one area, and for the same service, it is important that the same type of dialing be used. In a highway system a large number of code combinations must be provided in order to prevent erroneous

calls. In urban systems, it should be noted that a relatively low number of calling combinations should be sufficient, because the number of customers that can be handled per channel is quite limited. If a customer proposes to do a lot of traveling in a group of cities such as the region from Boston to Washington in the eastern United States, it may be desirable to put him on a highway mobile system.

Left to right: A. D. STERN, J. J. CLAIR, JR., M. BONNET, P. HAWKS, all of Frederick Hart & Co.

Traffic Handling Capacity

On the basis of the experience at St. Louis, it seems that before long several channels will have to be put in operation in larger cities. This stresses the desirability of making adjacent channel operation possible to get more channels and to provide methods for making optimum use of the existing channels. These now are being studied at General Telephone.

Point to Point Communications

General: The use of VHF and microwaves for point-to-point communications promises considerable advantages in the telephone industry. For one thing, they are not subject to service interruptions caused by sleetstorms, etc., or by the warfare between trucks and telephone poles. Low attenuation, equivalent to that in amplified circuits can be obtained. In addition greater flexibility can be obtained with such circuits as they can be switched from one route to another at fairly short notice and very moderate cost, a procedure which is impossible with wire routes. Successful demonstrations of VHF and microwave transmission links have been given during and after the war and their usability can be considered established. The problem of their use is, therefore, to a large extent one of cost and of availability of suitable equipment.

An interesting item in such point-to-point or toll circuits is the relative merit of microwaves and VHF, some of them will be listed here. VHF circuits should be obtainable at very low cost due to the development of sets for the mobile radio services which also can be used for this purpose. A reasonable extension of the number of circuits is possible through the use of existing or new carrier techniques. VHF circuits are not rigidly restricted to line of sight transmission, they can operate even if a certain amount of obstruction is present between transmitting and receiving antenna. In some circumstances this property can be quite important.

Microwave circuits have a very large available band width and for this reason offer an enormous capacity for growth when more circuits (for instance, 25-100) are needed. More channels are available, not only because of the larger available spectrum, but also because beaming of the transmitted energy is possible to a point were the same frequency can be reused very nearby provided the beam directions are different. Concomitant to the beaming is the fact that high power gains easily can be obtained in compact antennae, which will permit accommodations of many channels on a single tower.

It may be expected that both techniques will find a place in the telephone field. Accordingly, it would seem advisable to give both a field test at an early date, and this is the basis on which the General Telephone System is planning to proceed. A tentative prediction at this date would be that VHF will be used where obstructions are present or a limited number of channels are expected in any one direction and microwaves where clear line of sight paths are available and considerable expansion may occur. Some further aspects of these techniques will be discussed in the following.

VHF

Transmission: The term "line-of-sight path" applied to VHF or microwave transmission means that a straight line drawn from the transmitter to the receiver antenna clears all intervening obstacles. To check this profiles are constructed by plotting the terrain elevation as a function of distance from the transmitter. Corrections must be made at each point by subtracting from the actual elevation the amount by which the earth has dropped below a plane tangent to it at the transmitter site. To save time a special transparent graph-sheet was developed at General Telephone. It fits over the U. S. topographical maps (scale 1:62500) and reduces all operations to a single entry.

Having obtained a profile, the next problem is to determine what transmission may be expected over this path. The Armed Forces, especially the Army, have done and sponsored considerable work on this problem. As a result of this work, it is possible to compute approximate transmission data for a given path. Such factors as transmitted power, frequency, earth resistivity, etc., can be taken into account. At these frequencies radio waves still "hug the ground" to some extent and as a result intervening hills do not render transmission impossible per se.

Equipment: Good and reliable equipment for VHF is available because sets already have been developed for Army and for mobile radio use.

One of the obstacles yet to be overcome is the lack of simple, low-cost terminations. These interconnect the telephone line, the transmitter and the receiver. The speech circuits are equal to the hybrid termination of a four-wire repeater, but some signalling must be added.

Additional circuits may be obtained either by the use of carriers or by installing more and more single channel units. A choice between these methods largely will depend on their costs. It does seem indicated that the fairly low cost of duplicating transmitters puts a definite ceiling on the price levels at which carrier systems can compete.

Microwaves

Characteristics: Microwaves comprise the frequencies from about 3000 MC. on up. In contrast, the VHF bending around obstacles practically is absent, and direct line-of-sight paths are needed. Another important characteristic is the ease with which concentrated beams can be obtained. To get such beams, the dimensions of the antenna and/or reflector structure should be large in respect to the wavelength. The use of microwaves permits sharp beams with small antennae. While beams appreciably narrower than 10 degrees probably will not be needed for communication use, it is quite feasible to narrow them down to one degree or two degrees with antennae that still can be taken up in airplanes.

Economics of Small Bundles: Considerable publicity has been given to multi-channel microwave systems. Depending on the type, they may run from 24 channel, as used, pulse-time

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MOBILE RADIO-TELEPHONE SERVICE

By R. F. LUCIER
Member
USITA Commercial Committee

I AM sure the subject of radio-telephone service is new and not too well understood by most of the people in this room, just as it is to me.

Last April, members of your Commercial Committee met with members of the Plant Committee, together with B. C. Burden and E. H. B. Bartelink of the General Telephone Corp. to discuss the practical application of radio-telephone to the Independent field. Also present at the meeting was M. M. Hale, general commercial superintendent of the Lincoln (Neb.) Telephone & Telegraph Co., whose company was at that time making application to the FCC for an experimental license for the purpose of carrying on studies in "highway" radio-telephone service.

My knowledge of this subject is limited to the information gained during that two-day conference in April, plus the study of Bell company pamphlets on the subject and conversations with Bell personnel, plus inspection of radio-telephone stations operated by one of the Bell companies. . . .

I will limit my discussion to the commercial aspects of the service, in other words, the market and prospects for service and the proper tariff or schedule of charges.

I am convinced, from my very meager study of the subject, that there is a definite place in the Independent telephone field for this service, particularly for the companies serving large metropolitan areas and also companies whose territories stretch out for some miles along main traveled highways. Yet, in my opinion, it should not be entered into lightly as the cost of the equipment is rather expensive and the experimental operation and maintenance of such equipment very easily can run into a sizable figure. There also are other expenses such as engineering and legal expense in making application to the FCC for license.

While your committee did make a study of the rate situation, we thought best, at that time, to withhold any recommendations as to rates because our study was, of necessity, based on theoretical operating costs, and also because we were of the opinion that our findings might be misconstrued by regulatory bodies and might embarrass member companies who were carrying on experiments or who had made or were making application to the FCC for experimental licenses.

Since that time the Bell company has published rates for both highway mobile and urban radio-telephone service and it is my understanding that some of the member companies of this association have or are about to do the same.

Now that these rates have been published, it might interest you to know that the theoretical rates as arrived at by the committee were very near to those that have been published by the Bell operating companies and some of the larger Independent companies.

At first glance, it would seem to the average telephone man that these rates are exceedingly high, but that is no doubt because we have become so accustomed to looking at rates that are very low. We all appreciate the problem we have incurred in raising exchange rates to an adequate level, so that if any company contemplates going into the mobile radio-telephone service, it should endeavor to start with a rate that is adequate. Then, if improvements are made which allow for a change in rates, it is much easier to come down than go up.

In going over the tariff as filed by the Bell operating companies and Independent companies, such as the Lincoln (Neb.) Telephone & Telegraph Co., there are several things that at first glance might seem unorthodox to the average telephone man. One of the provisions I refer to is the one for subscriber owned mobile units. In other words, that portion of the subscribers' equipment that corresponds to the subscribers' subset in wire telephony.

In making inquiry concerning this, I was advised that such a provision was inserted because many concerns such as power companies, trucking companies and taxi companies already own their own equipment and it was thought easier to take over the operation of this business on a subscriber-owned basis. No doubt the history of this will be much the same as customer owned equipment, particularly PBX and miscellaneous equipment, which later was taken over by the operating telephone companies.

Also, there is the matter of measured service with which few of us in the Independent field are familiar. Because of the limited number of assigned frequencies radio-telephony takes on many of the aspects of the rural party-line, so that the number of conversations, as well as the number of customers, must be limited, particularly those subscribing for two-way service. Additional service which provides for one-way dispatching service and one-way signalling service allows for a much wider use of facilities.

Earlier in this talk I said that I was convinced that there is a definite place in our industry for this class of service. I know that many of you people who are operating smaller properties have the same doubts arising in your minds that arose in mine as to whether or not there is a place for your company, and where the breaking point might be as to the size of the company that can afford to install and carry on experiments in this field. I do not believe that question can be answered at this time and I believe that circumstances will govern that entirely.

Less than a year ago I thought of this service as a plaything of the rich and felt sure that the commercial application was many years in the future. After standing behind a mobile service position in one of the Bell exchanges and watching the operator connect incoming airplanes with land telephones and also watching truck drivers in suburban towns being connected directly with their headquarters, I had a feeling that the development of this service was much further along than I had realized.

Another question that arises in our minds is the limitations of markets for this class of service. In other words, what is the potential market? In considering this, we should differentiate between the immediate market and the ultimate market. As to the immediate market, probably the best prospects for service can be found in the utility field, such as power, gas and water companies. In other words, any utility that operates and dispatches service trucks. Other prospects are trucking concerns, food distributors, dairies, taxicab operators, store delivery systems and many, many others. As to the ultimate market, I think that one of the Bell company pamphlets gives the best answer to this when it says that the potential market is limited only by the number of motor driven vehicles in the air, on the ground and on the water.

(Please turn to page 94)

SMALL EXCHANGE CONVERSIONS

By C. C. PEARCE

Member
USITA Commercial Committee

I AM going to deal with the problems involved and some of the problems you may expect and should be prepared for when converting a small telephone exchange to dial operation. When I say small, I mean those little exchanges which are unattended in every way, that is, no operators or local information center, and more than likely the lines and equipment are maintained by a lineman from the neighboring exchange.

I also want to make it clear that I am discussing these problems for those small companies which perhaps have only one or two small exchanges which, for various reasons, they plan to convert to unattended dial. The information and problems discussed perhaps will be of little value to and even be contrary to standard practices in large operating companies that have a complete staff and various departments to handle each problem.

We will take it for granted that you have made a study of the exchange you wish to convert which probably is now a magneto exchange and one which you have decided will be more economical to operate on an unattended dial basis. We will take up some of the problems which immediately arise.

First, how will the people like the new service? If a neighboring exchange is dial operated, a large part of your education of subscribers to the new service already is done, but if no dial service is anywhere close, your problem will be somewhat different. This is especially true in the small towns in the agricultural area of the United States where dial operated exchanges are pretty well scattered.

In our own minds we know it will offer our subscribers the finest in telephone service but we must be careful not to force a radical change upon them which they may not be prepared to accept. We first must create a desire for this new type of service in the same manner that a desire is created for any other new product on the market. This should by all means not be overlooked, as the subscribers who might rebel at some new gadget thrust upon them present quite a different problem than those who look forward to and desire a new type of service.

This desire for a change to dial may be brought about by taking a few of the heavy users of telephone service to visit a town which has dial service. Let them see the equipment in operation, have them talk to some of the people who have the service, and, if possible, have them make a few calls so they can see how simple and fast a dial telephone operates. I might suggest it would be good business to take the local editor along on such a trip; that is, if the town is large enough to have a newspaper. This usually leads to a write-up on dial service in the local paper.

C. C. PEARCE

The history of the dial telephone also is good material for the local paper, even if you have to run it as a paid advertisement, and don't overlook having each man who is doing any work in the plant or in subscribers' homes thoroughly schooled to tell about the speed of dial service, and how a subscriber can hear the telephone ringing until the other party answers or the calling subscriber hangs up. It won't take long to create a desire if you work it from the right angle. This is more important than you may think.

About the next thing that pops up is, what will we do with the present operators? If they have worked only a short time and are not too "dear" to the subscribers, this may not present a problem to you. Possibly they are about to be married and will quit anyway or they may be old enough to retire. Sometimes it is possible to shift operators to neighboring exchanges. If the conversion is planned well in advance, it may be possible to take advantage of opportunities that arise so that this problem will take care of itself, but beware, it often is a touchy spot, especially if the operator has been at the exchange for many years and has offered a lot of secretarial service as is often the case in small exchanges. Sometimes it is well to pay the operator for a few extra months and explain that she also will be entitled to unemployment compensation after that, usually by that time she has secured another job, has married, or decided she would go to school.

With the disposing of the operators and closing the public office, another problem arises: That of collecting the subscribers' accounts. Sometimes one of the retiring operators can be given this job and also will report the subscribers' troubles to the main office. Usually a telephone is provided for her without charge and a small percentage or a flat sum per account is paid her for collections. Some companies have a store or bank act as a collecting agency on a similar basis, while others merely enclose a self-addressed envelope with the bill. I think it is well to have an employe of the company personally collect the business accounts in these small, unattended dial exchanges. This adds a personal touch which is needed.

If the same person does this regularly and spends some time talking with the merchants inquiring about their service, etc., the telephone company is gaining some goodwill that can't be beat. It also gives the collector an opportunity to size up the location of the merchant's telephone as oftentimes a second telephone or an extension is needed. Even if no further service is sold, let us not overlook the fact that a town served by an unattended dial exchange has very little personal contact with the telephone company.

Incidentally, do not fail to take advantage of all opportunities offered you for personal contact with the subscribers as their education should not end with the installation of this equipment. Very often certain dissatisfactions are revealed due to incorrect use of equipment, etc. A little advice and explanation may go a long way toward clearing up some of these problems.

Arrangements also should be made for a public telephone. This should be located in a place of business which is

open all night if such a place is available.

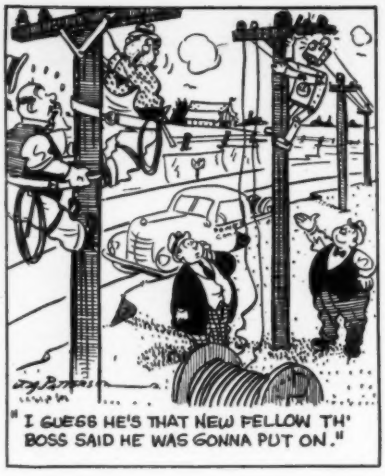
Now, if we are to close the public office, we must provide a building to house the new dial equipment. Very careful consideration should be given to the type of construction used so that the moisture will be held to a minimum, as this is one of the most important things to safeguard against. If moisture is kept to a minimum, the trouble in the equipment likewise will be minimized. Of course, the building should be tight enough to exclude dust, and should be of fireproof construction, both inside and out. Plenty of consideration should be given to the location of the building as here again the matter of public relations enters.

Let us not go back in the alley where "Chic" Sales located his "family special" and put up a building without design or thought of appearance. If you do, someone may paint a half moon up near the eave and hang a Sears Roebuck catalog on the door. Let us spend a few dollars more and buy a lot along the street, set the building back far enough to allow for landscaping, have a few shrubs and a green lawn, and have a little design to the building. A building of the type generally used easily may have a cold, nondescript appearance. A good-looking door and window will take away that look and will add considerably to the general appearance. A glass block window is fireproof, adds appearance, and also provides sufficient light within the building.

To many subscribers the appearance of the telephone office and the type of instrument in their homes, are the two tangible features which either denote an antiquated system or a modern system. They do not recognize readily outside construction details as you and I do and, unless they see a pole broken off or a wire broken and hanging down, they seldom notice the telephone line as they pass along the highway or street. So let us not forget that it is of importance to provide the community with an attractively designed building, however small it may be.

When people come to visit, the home folks generally drive the visitors around the town and point out the town park, the water works, the swimming pool, the river bridge, the school buildings, etc. Now, let us be sure that our telephone building is so designed and landscaped that it will always be one of the outstanding beauty spots of the town and will also be included on such trips.

It is, of course, always necessary to issue a new telephone directory at the time of the cut-over. This should be planned well in advance, but subject to



last minute changes as it involves considerable preparation and there are always plenty of last minute jobs to look after even with the best of planning. If you have rural eight or 10-party lines which will operate code ringing, it often is possible to give a subscriber the same ring he had before. Some of these little details I mention may sound unimportant, but changing from manual operation to dial is a radical change and details must be handled with care in order to avoid unnecessary confusion.

During the present time when materials arrive rather slowly, it is well to use some advertising to keep the subscriber notified of the progress that is being made, as telephone users, once informed of the planned conversion, oftentimes become impatient. They must be made to realize that to change from manual to dial is not as easy and quick as a magician pulling a rabbit from a hat.

A letter to each subscriber a few days before the cut-over is important and can overcome some of the dissatisfaction which sometimes occurs the first few days, due to the subscribers not understanding certain details of the operation of the new equipment and due to interruptions sometimes caused by adjustments in the equipment. Regardless of how careful you are to test out the equipment, there still is the outside plant which nearly always has a few weak spots that show up soon after the 48 volts are turned on.

This letter or card should explain that during the next few days telephone service will go through a very radical change, and it should warn subscribers that for a short time they may experience some difficulty due to everyone learning to operate his new telephone and that it may be necessary to adjust the equipment, but that after a short time their service will settle down and they will enjoy a type of telephone service that has no superior.

Remember a new telephone system is like a new binder, it must make a few trips around the field and have a few adjustments before it really starts tying all the bundles.

Oftentimes in planning a conversion from manual to dial in a small exchange, some new cable plant is placed in service, making it possible to connect a few telephones to the new equipment without disrupting the subscriber's present service. If 10 or 15 telephones can be connected for several days previous to the actual cut-over and the list of numbers provided for these telephones to that group, with instructions to make as much use as possible of their new telephones, it will give you an opportunity to check the actual operation of the equipment.

In purchasing equipment, be sure and buy enough to allow for a substantial growth as you will find considerable more demand for your improved service than you expect. Neither should one skimp on links and trunk equipment, as the calling rate usually will double, the holding time will be longer with improved service, and long distance service will be used more. I mention this because it is more economical to have sufficient equipment built into the original arrangement than to add it later.

I hope I have not built up in your minds the feeling that to convert an exchange from manual to dial is such a job, and that the conversion must be handled with such care that you would hesitate to attempt it. Quite the opposite is true if you have your complete plant in A-1 condition. By all means do not attempt to convert until every detail is in No. 1 shape. Not that it won't work otherwise, but it is for your own good, for if everything works well the first few months, you will find that subscribers will overlook troubles later on.

Perhaps you may take this more as a public relations article than one dealing with problems you had expected under the title of "Small Exchange Dial Conversions." Much information is available on the plant and technical side of our business so I have tried to offer a few other suggestions that may be of some help to those small companies contemplating their first conversions.

If you look after the little things which often seem unimportant and provide a good plant and modern instruments, you will find that the change from manual to dial will go very smoothly, and you soon will begin to hear subscribers say, "The more we use it, the better we like it."

TELEPHONE TARIFF REFINEMENTS

By H. W. PIKE

Chairman
USITA Commercial Committee

THE subject of tariffs is one which concerns everyone engaged in commercial work. Although the word "tariff" may sound somewhat complicated, it is merely the word generally used to cover rates, charges, and rules and regulations filed with the regulatory body.

The principal purpose of these comments is to set out the advantages of a tariff for those companies which do not have one, and possibly also to suggest some additional items to be included by those companies which already have a tariff in use.

It is my belief that every telephone company actually has the "makings" for a fairly complete tariff, because most companies which do not have a tariff set down on paper have as definite rules and regulations as other companies.

Rates and charges usually are kept in written form somewhere in the office, but often the rules and regulations in such cases are in the minds of the management or commercial people, and are passed on to new employes a bit at a time.

Experience a good many years ago, when we worked without a complete printed tariff, convinces me that it is very much worth-while to maintain a tariff for each exchange, setting out all of the rates, charges, rules and regulations, so that they can be referred to by any employe; and even read from time to time so that prompt answers can be given to most questions.

Earlier this year, your Commercial Committee had in mind the preparation of a skeleton tariff which would, in general, represent a minimum of desirable rules and regulations which reasonably would be applicable to all companies, but the press of other work prevented completing this undertaking. Typical tariffs, however, have been prepared by the Minnesota Telephone Association, the Illinois Telephone Association, the Pennsylvania Independent Telephone Association, and the Michigan Public Service Commission, and there also may be other state associations or commissions which have done similar work.

In the time available here, it is, of course, impossible to discuss all of the provisions which are desirable. I am sure, however, that all of you who would like to prepare a tariff can examine copies in the exchanges or offices of companies which have already established workable ones, for the purpose of deciding the general method to be followed.

Before going into some of the items which might be referred to as "refinements" of a tariff, I would like to urge those of you who are connected with companies which do not have a complete tariff to take steps to get your rates, charges, rules and regulations into written form as the matters occur to your management and commercial people. If such a practice is followed,

H. W. PIKE

in the course of a few months you will have practically everything that is needed, and then it is necessary only to adopt some reasonable method of getting it into printed or typed form.

I agree with those of you who think that the preparation of a tariff will take considerable time, but, in the same breath, I want to point out that when it once is established, there will be considerable lightening of the day-to-day routine work, because employes can be trained to learn the answers from the tariff, rather than by conversation with supervisory people.

In taking up the subject of refinements of the tariff, it may be simplified by pointing out that the tariff consists of two major divisions, the "exchange tariff" and the "toll tariff."

For purposes of this discussion, the toll tariff will be disposed of rather briefly.

Nearly all Independent companies, and I think this is particularly true of those companies which already do not have complete tariffs, apply Bell System rates for toll messages. Where this is the case, it usually will be found sufficient to state that the company concurs in the toll rates established by whatever Bell System company is operating in its state.

In addition to the concurrence mentioned above, there may be some special toll rates between certain points which are more or less than standard Bell rates. Where this is the case, such special rates usually either are set out as exceptions to the concurrence previously mentioned, or a statement is made that exceptions to the standard rates are shown in connection with the exchange tariff.

As a matter of practice, companies operating more than one exchange usually consider the exchange tariff as having two parts. In such cases, the rates and charges for each particular exchange are referred to as the "local exchange tariff," and the body of rules, regulations, rates and charges which are applied uniformly to all exchanges are referred to as the "general exchange tariff."

It is not our purpose here to discuss what rates and charges ought to be, because these are problems to be met by each particular company. On the other hand, there gradually has grown up within each state a more or less uniform body of rules and regulations which are reasonably adaptable to all companies within the state, and it is these particular rules and regulations which I would like to emphasize here.

Initial Contract Periods: The usual initial or minimum contract period for most types of service is one month, but installations such as PBX systems, intercommunicating systems, and, in general, any service which requires abnormal investment or installation costs reasonably may require an initial contract period of from one year to five or even more years.

In all such cases it obviously is desirable that the telephone company should be protected by a contract with a minimum life which reasonably is related to the investment involved.

Application of Business and Residence Rates at Various Locations: It is desirable that the types of locations at which either business or residence

rates apply should be clearly set out. In most cases it is not difficult to make the distinction, but it would be well for the tariff to be quite complete, and it appears that the best suggestion to make with respect to this item is to model the statement after the tariff of a responsible company which already has this provision filed in your state.

Directory Listings: Limitations as to the number of free listings should be set out clearly, and the kind of listings which will be permitted also should be covered adequately.

Local Service Area or Local Base Rate Area: In order to establish clearly the area in which the telephone company is willing to render local service—usually one-party service, two-party service, and four-party service—without additional charge, it is desirable to describe this local base rate area or include a map in which such area is outlined for each exchange.

In general, rural service is the only type of service furnished outside the local base rate area unless additional mileage charges are added to the local rate.

Mileage Charges: Mileage charges, or excess mileage charges, or over-radius mileage charges, ought to be established for customers desiring one of the types of local service when they are located outside the local base rate area.

These mileage charges probably most often are quoted on the basis of each quarter-mile or fraction thereof, although they sometimes are quoted on some other unit of length.

Use of Service and Facilities: Under this subject, it is desirable to cover the fact that all facilities shall be owned and furnished by the telephone company, and that the telephone company shall have the right to enter the premises for inspecting, repairing and removing same.

Provision should be made to prevent the attachment or use of any equipment not owned by the telephone company, and provide that tampering with telephone equipment makes such equipment subject to disconnection or removal.

It also is desirable to provide that telephone service is furnished only for the use of the customer, his family, employes or business associates.

As to party line service, it is desirable that the tariff include a provision that customers on party lines shall not interfere with an equitable use of the service by other customers. If the duration and number of local messages by a party line customer is so great as to prevent equitable use by others, the telephone company should reserve the right to require the customer to contract for a higher grade of service or discontinue the service of the customer making unreasonable use of the line.

A provision limiting the use of facilities for a local message to five minutes also is reasonable.

Telephone Numbers: Every tariff should provide that the customer has no property right in the telephone number, and that the telephone company may change any number whenever it deems it desirable or necessary to do so.

Telephone Directories: It is customary to provide that telephone directories are issued to customers in the form and to the extent necessary for efficient use of the service.

It particularly is important to state that the telephone company does not assume responsibility for errors or omissions in preparing or printing the directory.

Service Stations: For exchanges which provide central office facilities to service station lines or switched lines, it is desirable to include regulations stating the maximum and minium number of stations per line which will be served, and the terms under which facilities of the telephone company will be furnished. If conditions permit, provisions should be made for billing charges for all service station customers to an official of the service station line, rather than to render individual bills.

Overtime Work or Interruptions of Work by Customers: Experience in recent years has shown that it is highly desirable to provide in the tariff that if the customer desires to have work done when overtime rates apply, or interrupts work once begun by the telephone company, that all labor costs incurred in excess of any fixed charges applicable to such work, shall be paid by the customer.

Disconnection for Unreasonable Interference: In addition to prohibiting the use of party line service to interfere with usage by other customers on the line, as previously mentioned, it is desirable that the tariff shall provide for immediate disconnection whenever any customer so uses the service as to interfere with or molest other telephone users, or for use of the service for any purpose other than as a means of communication.

In this rather hurried review of the more important items of the tariff, no consideration has been given to a number of other desirable and pertinent points such as form of application, establishment of credit, deposits, application of service connection and move charges, use of profane or indecent language, termination of service, joint users, public and semi-public service, rural line extension rules, miscellaneous equipment, PBX service, seasonal service, wiring plans and various other items which no doubt will occur to you.

In general, however, any rule or regulation which uniformly is applied may be considered for inclusion in the tariff. One of the best methods of determining what should be included and the form to be used is to examine the tariffs of one or more of the larger companies operating in your state.

In conclusion, I particularly urge that even though there is a large amount of day-to-day work which must be done, this is a good time to prepare or revise tariffs, because the questions and problems which we have had to meet in recent years are still fresh in our minds, and the time which eventually will be saved through written rules and regulations will more than offset the current work required.

Our Manners

MANNERS are the shadows of virtues; the momentary display of those qualities which our fellow-creatures love and respect. If we strive to become, then, what we strive to appear, manners often may be rendered useful guides to the performance of our duties. A man's manners are a mirror in which he shows his likeness to the intelligent observer.

—Atlantic Coast Line News

Look Around You!

There is hardly any place or any company where you may not gain knowledge, if you please; almost everybody knows some one thing, and is glad to talk about that one thing.

—LORD CHESTERFIELD.

REPORT OF TRAFFIC CONFERENCE

By MAYME WORKMAN
TELEPHONY'S Traffic Editor

APPROXIMATELY 140 people attended the traffic conference at the USITA convention on the afternoon of October 14, exceeding all previous attendance records.

W. A. Kern, vice president of the Rochester (N. Y.) Telephone Corp. and chairman of the USITA Traffic Committee, presided at the meeting. In his introductory remarks Mr. Kern stated, "A conference, according to Webster, is a serious consultation or discussion" and, stated the speaker, "we never have faced as many difficult problems in our industry. Our traffic conference is aimed along that line—to find a solution to the present traffic problems."

The first speaker introduced by Mr. Kern was Mayme Workman, traffic supervisor, the Illinois Telephone Association and traffic editor of TELEPHONY. Mrs. Workman's subject was "A Small Office Operating Practice." The speaker stated, "One of the major functions of the USITA Traffic Committee is finding ways and means of being helpful to management and traffic employes in their responsibility of rendering satisfactory telephone service to the public. A great deal of effort has been made to interest state associations in acting as a clearing house in finding a solution to the traffic problems of its member companies and it has been suggested that this best can be accomplished by appointing a traffic committee or, if possible, to employ a traffic supervisor whose services would be available to member companies in making service surveys, coaching and training chief operators, supervisors and operators, making traffic studies, and furnishing many other services not usually available to small and medium sized telephone companies from any other source."

The speaker stated that the topic was a timely one since her association recently has issued a *Local and Toll Operating Practice for Tributary Offices*, and that this operating practice has been distributed to tributary offices of member companies of the Illinois Telephone Association.

Mrs. Workman stated, "The urgent need for an operating practice for tributary offices long has been recognized. However, furnishing the practice was not the final solution to the problem. A method had to be devised for keeping it up-to-date. After this problem was solved, and the board of directors authorized the preparation and publication of the Practice, the work of preparing it was begun. Two years of time that could be spared from the traffic supervisor's regular duties were required to complete it."

The speaker explained the set-up of the *Operating Practice*. She stated, "The *Local and Toll Operating Practice for Tributary Offices* contains three divisions: Division I, General Instructions for Chief Operators and Operators; Division II, Local Operating Practices, and Division III, Toll Operating Practices. The *Practice* is in

MAYME WORKMAN

loose-leaf form to permit the addition or removal of pages, when necessary.

"A number is assigned to each copy of the *Practice*. The traffic supervisor will keep informed of changes in operating practices affecting tributary offices and the necessary information will be mailed to each company and person having a copy of the *Practice* so that it may be kept up-to-date."

In conclusion Mrs. Workman stated, "Compiling the *Local and Toll Operating Practice for Tributary Offices* was a big order and keeping it up-to-date will be no small task, but the satisfaction of furnishing a solution to one of the major small office problems makes the effort worthwhile."

Esther Hummel, traffic supervisor, Illinois Commercial Telephone Co., Springfield, presented the topic, "Present Day Traffic Problems." Miss Hummel stated, "When Mr. Kern, our traffic committee chairman, assigned me the subject, 'Present Day Traffic Problems' I could think of only one major problem, *service*. Just imagine," said the speaker, "only one problem in the traffic department. Wonderful, isn't it? But, service covers a multitude of very important problems, some of which I will attempt to enumerate. All I have to do," said Miss Hummel, "is to enumerate them, because my good friend, John Reding, is the 'answer man' and he will tell you the solution to some of these problems."

The speaker stated, "We in the telephone business have only one item to sell and that is *service* to the customer. I use the word service to designate the subscriber's attempt to call other subscribers. This product is inextricably bound to, or in with, the personnel that renders the service. The quality of the service, if good, can be credited to traffic personnel, or, if poor or indifferent, it can be improved through personnel. In addition to personnel, we now have to consider equipment as a major item controlling service.

"In the past years," said Miss Hummel, "we were able to give the customer the very best service obtainable because the small percentage in force turnover resulted in a high percentage of experience and because we had adequate facilities to give such service. Our customers had been educated to a quality of service that we cannot maintain under existing conditions. We thought during the war we had reached an all-time peak in traffic, but we realize now that we were merely rehearsing for a bigger and better show. The customer believes that because the war is over, his service should be improved accordingly. He cannot see what we are doing, therefore, he becomes impatient and critical."

Miss Hummel stated that shortages of switchboard positions, toll lines, subscribers' lines and trunks have taxed the ingenuity of traffic and plant men and that due to the lack of sufficient local and toll switchboard positions, it has been impossible to handle properly the large volume of traffic offered and render the desired grade of service to the customer.

According to the speaker, "Lack of toll line facilities greatly handicaps the completion of toll calls, both inward and outward. Posted delays become necessary and cancellations are numer-

W. A. KERN

ESTHER HUMMEL

J. F. REDING

ous. Tributary offices are affected seriously in passing calls to the toll center for handling.

"Lack of subscribers' lines creates a serious management problem because of the demands for service and greatly involves the traffic department. The assignment of all vacancies on party lines incur heavy positional loads and create a shortage of cord pairs for operators' use."

The speaker stated that "Reassigning numbers appearing in the current issue of the directory creates excessive work for information and intercept operators and in many instances it becomes necessary to assign a special intercept and information operator at offices where none had been used, as the directory changes are so numerous that switchboard bulletins are inadequate."

Miss Hummel said that lack of sufficient toll recording trunks means holding the customer undue periods of time while waiting for a trunk to become available. Lack of toll switching trunks results in delays on inward service and backing up of outward and delayed calls. Inter-position trunks and trunks to auxiliary lines are inadequate to handle the volume of traffic.

Maintenance of switchboards in the central office has been a major problem, she stated. "In past years if there were cords capped and trunks out of order, we could manage, as we knew that 'Sam' was out installing some of the telephones that we had managed to solicit during our 'Add-A-Phone Campaign'—remember? But not today. Every piece of equipment must be kept functioning and in workable order. Often this requires the plant man to work late in the evening when positions are unoccupied."

Speaking of force turnover, Miss Hummel stated, "There is little doubt that we shall continue to encounter a tremendous turnover in our traffic forces for some time. Certainly more than during prewar years. Our forces have increased beyond anything we ever forecasted. During war years most of our turnover could be attributed to resigning to accept more lucrative positions, moving out of town, or marriage. We now find that present turnover is caused by ill health, leaving city, home duties, marriage and securing other positions affording better working hours.

"It might be interesting to know what our analysis of force losses for the first six months of 1946 revealed. Of the 278 resignations, 39 resigned to take other positions, 37 due to marriage, 47 due to home duties, 12 returning to school, 50 leaving city, 41 due to ill health, eight dissatisfied with hours, 13 dismissed, eight dissatisfied with work, and four dissatisfied with salary. Traffic losses for the first six months in 1945 were 188 compared to 278 for the first six months of 1946."

Discussing recruiting difficulties Miss Hummel said that "Due to our inability to obtain full-time operators in some exchanges, the employment of high school and college students became necessary in order to replenish our forces. The use of part-time employes has added an additional burden to the traffic department as it is necessary to rearrange tours of duty to suit their study periods. Initial training becomes a very lengthy process. In some areas it is most difficult to obtain applicants as the hours of duty are objectionable. Where seniority is in effect, new employes resent having to start with late tours and working such tours for indefinite periods. Premium pay for evening, night, Sunday and holidays has not been the answer to our employment problem. Standards of requirements for applicants have been lowered in some companies in order to secure applicants and in some instances age limits also have been disregarded.

"Working long hours and carrying abnormal loads has accounted for the high percentage of resignations due to ill health. The majority prefer to work a 40-hour week. A small per cent are dissatisfied with reductions in take home pay where we have been able to reduce the work week from 48 hours to 40 hours," Miss Hummel said.

In connection with employe relations, the speaker said, "They are at a very low ebb. Supervisors complain in dealing with operators, and vice versa. Due to lack of qualified persons in our operating forces we have, in some instances, appointed girls as chief operators and supervisors, knowing they are not leaders and do not possess the ability to deal fairly with employes. We have girls in some of our forces today that during normal conditions we would not consider employing. Nevertheless, we have them, so what are we going to do about them?" Miss Hummel continued:

"We speak of the morale of our operators and supervisory forces. Our forces are working under conditions never before experienced. The operators become curt, irritable and argumentive with the customer and other operators. Discourtesy is very evident. Supervisors are hesitant to correct or censure the operator as in many instances it means a resignation. Supervisory forces do not take the time to give words of commendation.

"Personnel problems involve not only consideration of employes' wages and hours but the very important subject of working conditions. Working conditions not only involve the operating room with its problems of heating, ventilation and comfort, but rest-

room quarters as well. Have we lost sight of the fact that working conditions play an important part in the service furnished? It might well be remembered that service in a community is no better than the training and the facilities that are provided the operators to give that service. Due to lack of critical metals, labor and other articles, we were unable to provide electric fans, comfortable restroom furniture, operators' chairs, headsets, headset compartments and other items. Quarters were neglected sadly because we were unable to secure satisfactory janitor service. Redecorating was unobtainable. But like the customer, the operator wants to know, 'What are we going to do about it?'

"Good service is based upon constant supervision, training and observation. Due to excessive traffic and force shortages, initial training programs were shortened and practically no follow-up work was given. Lack of trained personnel and switchboard positions made training an ordeal for the operator and the instructress. Operators were placed at the switchboard with limited knowledge of operating practices. Many became discouraged and resigned. Older and experienced operators were further burdened with the task of trying to assist the student in her difficulties. Chief operators and supervisors are required to work at the switchboard, with the result that very little supervision is given. The operators become so disinterested that there is little incentive to induce them to accept supervisory positions.

"No retraining was possible due to force shortages. Consequently many former employes and experienced operators hired during the war have worked without much needed supervision. This applied to new employes with limited initial training, too. Supervisors also fell into this category as the chief operator did not have the time to give them the needed supervision and training.

"During the war it became necessary to restrict operating practices in order to secure ultimate circuit usage and conserve operating time. All of which are not understandable to the customer. We used to stress completion, now in some instances we ask for cancellation of the call. Combined line and recording methods were abandoned due to necessity for customer release. Many important records were discontinued; some were needless records, while others were used as a barometer for service and engineering. We discontinued much of the personalized service that the customer had been accustomed to, such as giving out the time of day, transferring local calls and other personal services."

Miss Hummel said that, due to the lack of supervision, toll tickets are prepared carelessly and are not checked for errors, resulting in incorrect billing by the accounting center and creating dissatisfaction to the customer. Over and under timings on toll tickets are due to lack of supervision. Toll calls are not supervised to prevent backing up of traffic and to obtain ultimate circuit usage, such as screening and posting delays.

In concluding her address Miss Hummel stated, "Service complaints are accepted as part of the day's routine. Some supervisory people take the attitude that they are dong the best they can, so 'Let them complain.' A record of complaints is not maintained and there is no follow up to see if service is improved."

Chairman Kern introduced the next and final speaker, J. F. Reding, general traffic superintendent, Commonwealth Telephone Co., Madison, Wis., the so-called "Answer Man" to our present day traffic problems. He presented the topic, "Does the Future Hold Solutions to Our Present Day Problems?"

Mr. Reding stated that today's traffic problems are: (1) Shortage of equipment, (2) toll circuits, (3) personnel and (4) trained personnel. He said, "We would sleep better if we had the answer to our problems. In 1933 we had too much of everything—now we don't have enough of anything."

In speaking of "held orders" the speaker said the problem is "to sell or not to sell," when there is a shortage of local switchboard or dial equipment.

"Why are we short of equipment?" queried Mr. Reding. "It is because we are selling more service than switchboards were designed for. Holding time is increasing on local and toll calls. The remedy for this condition is switchboards, trunks, dial terminals and toll circuits."

Mr. Reding gave some temporary remedies such as: (1) Recording toll calls at chief operator and special PBX desks, (2) screening calls and (3) providing equipment to enable supervisors to record calls.

In speaking of maintenance, the speaker stated, "Many switchboards in Independent exchanges are under-engineered as to cord pairs — for example, having 15 when 17 cord pairs should be provided. Cord pairs should be kept in perfect working condition."

Regarding training, Mr. Reding said it should be done during light hours, afternoons and evenings, nights, Saturdays and Sundays, as necessary. He related how picture boards are used in larger offices for training purposes.

"The principle cause of discourtesy on the part of the operating force is due to being hurried and this problem will be solved when the strain of operating is relieved by providing more equipment and handling lower loads," Mr. Reding said.

He also suggested encouraging courtesy by posting bulletins and organizing training programs.

As to service complaints the speaker stated that "One point we cannot stress too much is prompt treatment of complaints. Let the customer know your problem. He cannot see us at work. Tell your story by advertising. Inserts can be used effectively. Encourage customers to visit your office.

"Two things affect employment and turnover—(1) supply of and demand for employable women, and (2) undesirable features. There are more women in business than ever before. More people want women in their businesses. We must work harder to recruit them. This best can be accomplished through newspaper advertising, radio, posters in business offices, high schools, street cars and talks to senior girls resulting in leads from employes—they are the best recruiters. Parties in restrooms, with each employe bringing a prospective employe, have been successful," he said.

The undesirable features of telephone work, according to Mr. Reding, are: "Irregular hours and evening, night, Sunday, holiday and Saturday working hours. Objection to 48-hour week where these hours are in effect."

A solution to this problem is the shortening of evening tricks, use of rotating schedule, when possible, and premium pay. However, as basic rate increases, premium pay loses its attractiveness. Glamorize the work of the operator. Point out that by working on Sunday the operator has a week-day off to do shopping, Mr. Reding pointed out.

In summarizing the solution to our present day problems Mr. Reding said:

"Our equipment and circuit shortage will be solved by the increased use of carrier circuits. Service will be improved when equipment and circuits are more plentiful. The personnel problem will be solved to some extent by operator toll dialing, automatic toll ticketing, etc.

"Competition for female employes will increase in the future. The telephone company used to be the largest employer of women. This is not true today. The majority of women in industry will remain in industry. Wage levels will go higher. Differentials will narrow between wages of men and women. As labor costs go up, machines will replace labor.

"Dial installations will not make more women available in our industry as the increase in business will absorb them. We will always have operators."

In summarizing the topics presented in the traffic conference, Chairman Kern recommended that "for the immediate present, see that needed equipment is in order. Make the job attractive and encourage older operators to welcome new people. About 90 per cent of the people we employ today are acquainted with our present employes."

DEVELOPMENTS IN ACCOUNTING

By RALPH D. HEUSEL

Chairman

USITA Accounting Committee

A NUMBER of interesting accounting developments have received the attention of the Accounting Committee of our association during the past year. Our committee held two meetings in 1946, giving consideration to the subjects being presented at this conference.

The Federal Communications Commission amended Part 31 (Uniform System of Accounts for Class A and B Telephone Companies) to provide for the inclusion in Account 122, "Materials and Supplies," of amounts based on current prices new with respect to recovered material consisting of reusable minor items. Notice of action so taken by the commission was covered by Public Notice No. 88242, dated January 9, 1946. The amendment became effective August 1, 1946.

The question of proper distribution of costs in keeping and billing customer accounts was the subject of correspondence by the secretary of our association with the Federal Communications Commission. The system of accounts provides that the cost of keeping and billing customer accounts, when performed in the course of local commercial operations, is chargeable to Account 645, Local Commercial Operations. When this work is performed by the accounting department, the cost of keeping and billing customer accounts is chargeable to Account 662, Accounting Department. In tabulating industry statistics and making comparisons, there are apparent advantages in having all costs related to customer accounts chargeable to the same account. In response to the proposal submitted to the commission that this cost be charged to Account 662, Accounting Department, rather than to the appropriate accounts of the operating departments, such as Account 645, Local Commercial Operations, when such work was performed by the local commercial office.

We were advised by the commission that while there was a division of opinion as to whether the type of change which was suggested should be made in the accounting regulations, there appeared to be virtually unanimous feeling that the specific amendments suggested could not very well be adopted consistently without adopting numerous other amendments that would serve to convert the entire system of primary operating expense accounts from a departmental basis to a functional one. Since it appeared that only a small percentage of the Independent industries billed and maintained customer accounts as a part of local commercial operations, it was the opinion of the committee that the treatment of this class of expense should be continued on the basis presently prescribed in the Uniform System of Accounts.

During the year the association was

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requested by the Federal Communications Commission to submit its views on the proposal to adopt an amendment to Part 42 (Preservation of Records) permitting the micro-filming of records. It was the opinion of the committee that a rule permitting the use of microfilming should be adopted. It is my understanding that the commission has not yet issued any amendment in this matter.

On March 20, 1946, the Federal Communications Commission issued its Report No. 131 amendment Part 42 (Preservation of Records) of its Rules and Regulations by adopting a new section, 42.5, requiring the maintenance by communication companies of an index of records, such new section to become effective six months subsequent to the date of this action. Representatives of interested companies and associations, including the United States Independent Telephone Association, consulted with representatives of the commission and submitted comments and suggestions with respect to said new section.

The commission has just released an amendment to Part 42 (Preservation of Records) of its Rules and Regulations to provide alternative procedures in the indexing of records. The alternative provides that in lieu of the requirements of paragraphs (a), (b) and (c) of the amendment, "a company that has delegated the responsibility for the identification, location and preservation of its records to the various departments, divisions, or offices of such company, may file with the commission, in duplicate, maintaining a copy with the officer referred to in Section 42.11, a statement showing (1) the title (or other designation) of each officer or employe to which such responsibility is delegated (indicating the chain of responsibility), (2) the designation of the department, division or office wherein such person has responsibility for the records, (3) a general description of the types of records under such supervision and (4) the address where the indexes which are maintained of the records under the supervision of each such person may be inspected by representatives of the commission; provided that such indexes of the records shall be available for inspection by representatives of the commission; and provided further that indexes of records originated by predecessor companies, where not now available, shall be prepared at such time as the commission may direct." It is further ordered that the effective date of Section 42.5 of the commission's rules, in its entirety, be fixed as of March 20, 1947.

In May, 1946, the Federal Communications Commission submitted to the association for an expression of its views, proposed telephone accounting Cases 21 to 24, inclusive, which were intended to be issued as interpretations by the chief accountant pursuant to Administrative Order No. 2. No protest was made to the proposed treatment of the questions covered by Cases 21, 22 and 23, covering the subjects of premium on capital stock; non-promotional advertising, the type sometimes referred to as institutional advertising or goodwill advertising; and the treatment of charter or bonus fees incurred in the corporation of a new company, also the treatment of such fees in the case of a merger or con-

solidation of two or more companies. Members of the Accounting Committee did take exception to certain phases of proposed treatment of discount, expense and call premium applicable to reacquired securities as set forth in the proposed Case No. 24. Two alternative plans were suggested for amortizing this expense which would permit a basis somewhat more liberal than that contemplated by the commission. Under date of July 17, 1946, the Federal Communications Commission released its Telephone Accounting Circular No. 13 which included Cases No. 21, 22 and 23. The commission apparently decided against issuing an interpretation at that time for the treatment of discount, expense and call premium applicable to reacquired scurities.

Under date of August 7, 1946, the Federal Communications Commission issued its Order No. 89-A rescinding Order No. 89. Said Order No. 89, adopted December 23, 1941, required Class A and B telephone companies to maintain subsidiary records and to segregate plant and depreciation reserve accounts with respect to "emergency facilities." Order 89-A further provides that in discontinuing the segregation of plant and depreciation reserve accounts heretofore required, each telephone company having emergency facilities shall either "(1) merge the depreciation reserve for emergency facilities with the depreciation reserve for regular plant at the time, determined on the basis of appropriate estimates, when the balance in the depreciation reserve for emergency facilities plus future depreciation accruals at the rates used for corresponding kinds of regular plant will provide for the loss in service value of the emergency facilities; or (2) recompute and apply proper depreciation rates to plant, after emergency facilities have been merged therewith, in accordance with paragraphs (a) and (b) of Section 31.02-80, Part 31 (The Uniform System of Accounts for Class A and B Telephone Companies) of the Commission's Rules and Regulations."

You all, undoubtedly, are familiar with the requirements of the Federal Communications Commission with respect to the establishment of a continuing property record, the final date of completion having been deferred from time to time, the commission having set June 30, 1946, as the latest date within which subject companies should complete their continuing property records. In response to an inquiry issued by our association regarding the possibility of a further extension of time for subject companies which have not yet completed or could not complete the inauguration of such records by June 30, 1946, the commission advised the association that it believed further extensions of deadlines should be confined to individual petitions and then these would be subject to monthly progress reports.

Another matter that was given considerable attention by the committee was the accounting problem on the small telephone companies. There have been many requests received by the Washington office of the association and editors of the industry magazines for a simplified accounting system for small companies. A number of such systems have been developed from time to time, one of which Harold C. White of the Jamestown Telephone Corp., Jamestown, N. Y., a member of our committee, adopted for maintaining accounting records of a small telephone affiliated company, such records being maintained under his supervision. Ward Hinman, chief telephone engineer of the New York Public Service Commission, who developed this system, was unable to be present at our conference. However, he gave Mr. White permission to present this plan and has made available for distribution copies of forms and instructions which were developed for use in the application of this system.

A STUDENT OPERATOR

MY first thought when I entered the operating room of the telephone company on my first day as a student, was how so many girls could work so swiftly, so efficiently, so silently in manning a switchboard, which at that time seemed to me like a very frightening combination of holes, cords, plugs, keys, charts, clips, numbers, wires, pencils, paper, key jackets, lights, lines, buttons and—"Heavens! I'll never be able to do that!" I moaned to myself.

After some very intensive training at a dummy position of the A board, and more intensive instruction at tables in a far corner of the operating room, my instructress told me that as a reward for my untiring (was she kidding?) effort, I was to take actual calls. Strutting with great pride, and headset high, to position No. 22, I swiftly plugged in my headset, just as instructed, sat down quickly, just as instructed, and picked up my first back cord, also just as instructed. Miss Instructress stood directly behind me and said, "All right, answer the next signal in your position."

I was tingling with excitement—here I was *finally* a part of the big wheel that revolved—answering, connecting and disconnecting, answering, connecting and disconnecting. I was reciting to myself: "Number, please? Thank you. Number, please? Thank you."

A light flashed on, I inserted a plug, at the same time noticing that the signal was the telephone in my home, "Number, please?" I queried meekly.

"Pleasant 6040," said the caller.

"Hi, Joe!" I retorted and was whisked away from the switchboard for more instruction.

Eventually, I became a junior operator. There still were tricks of the trade to be learned, but those were taught as the various incidences arose. For instance, one chilly morning I went to the switchboard, wearing a woolen suit. I soon became too warm so I stood up, took off my suitcoat, neatly hung it over the back of the chair, sat down, readjusted my chair by giving it a few quick spins and then noticed that every operator down the line was staring open-mouthed and wide-eyed. It was then that the supervisor told me that "Hereafter if you wish to remove your coat or readjust the position of your chair, just ring for your supervisor who will do it for you." Oh, well, I was more comfortable anyway!—*By Marion E. Shire, Associate Editor, TELEPHONY.*

V V

Fire Heroine's Award Presented to Son

John Joseph Berry, 16-year-old son of the heroic Mrs. Julia C. Berry, the switchboard operator who gave her life in the June 5 La Salle Hotel fire, that hundreds of guests might be awakened and saved, October 9 received the Theodore N. Vail gold medal and $1,000 citation.

The award was presented by William V. Kahler, vice president of the Illinois Bell Telephone Co. in the office of the Chicago Vocational School, where John Berry is a first-year student.

SMALL COMPANY ACCOUNTING

By H. C. WHITE
Member
USITA Accounting Committee

AT A recent meeting of your Accounting Committee, it was the consensus that sufficient time should be set aside for a discussion of the accounting problems which confront the smaller telephone companies. It was proposed that a study be made of some of the more simplified systems recently developed, to determine if our committee could recommend a simple system which would fit the needs of almost any small telephone company.

We found this to be very difficult, due to the different requirements of the state commissions and also due to the fact that most of these systems were too difficult to operate without the assistance of trained personnel. There is a crying need for a system of keeping records which is so simple that the manager of a small company can record his day-by-day operations and accumulate data enabling him to furnish the many governmental and taxing bodies with proper reports and to pay proper taxes. More important to him is the fact that he wants to know if he is making or losing money and if his investment is still intact.

The committee discussed not one, but several systems which have a lot of merit and finally agreed that the system least complicated of all was the one designed by Ward Hinman, chief engineer of the telephone bureau of the Public Service Commission of the State of New York, Albany, N. Y. (TELEPHONY, July 27, 1940, page 15).

Mr. Hinman, being an engineer, approached this problem from a very practical standpoint, rather than from an accountant's point of view. Ordinarily, when an accountant creates an accounting system, he wants a model system that will give the correct answer to a lot of questions which may never arise. The result is that the system created is so intricate and complicated that the average person is confused and frightened before he has a chance to get acquainted with it. Mr. Hinman has had considerable difficulty getting Class D companies to make intelligent reports. The managers of these small companies usually have very meager records and in many cases their entire report is made up from the stubs of a check book at the end of the year. As a result, the reports are far from accurate and it is a miracle that such an operator can make proper reports to the Collector of Internal Revenue and other governmental agencies.

The committee did not wish to make any specific recommendation of the Hinman system but thought it would be an excellent idea to invite Mr. Hinman to come to our annual convention and explain his system. He thought it might be possible to do so, but he was unable to attend on account of the volume of work in his office at this particular time. Inasmuch as I was instrumental in arranging this part of the program and have had a little practical

H. C. WHITE

experience with the actual operation of this system in a small company, which we purchased a couple of years ago, the presentation of this paper was assigned to me. I am glad to pinch hit for a man like Mr. Hinman, because he has gone beyond the call of duty and devoted a lot of time assisting small telephone companies in the state of New York. In fact, this system was tailor-made for a small company of about 300 stations and has been in successful operation for more than six years. It now has over 400 stations and can continue under this system even if it gains another hundred stations or more.

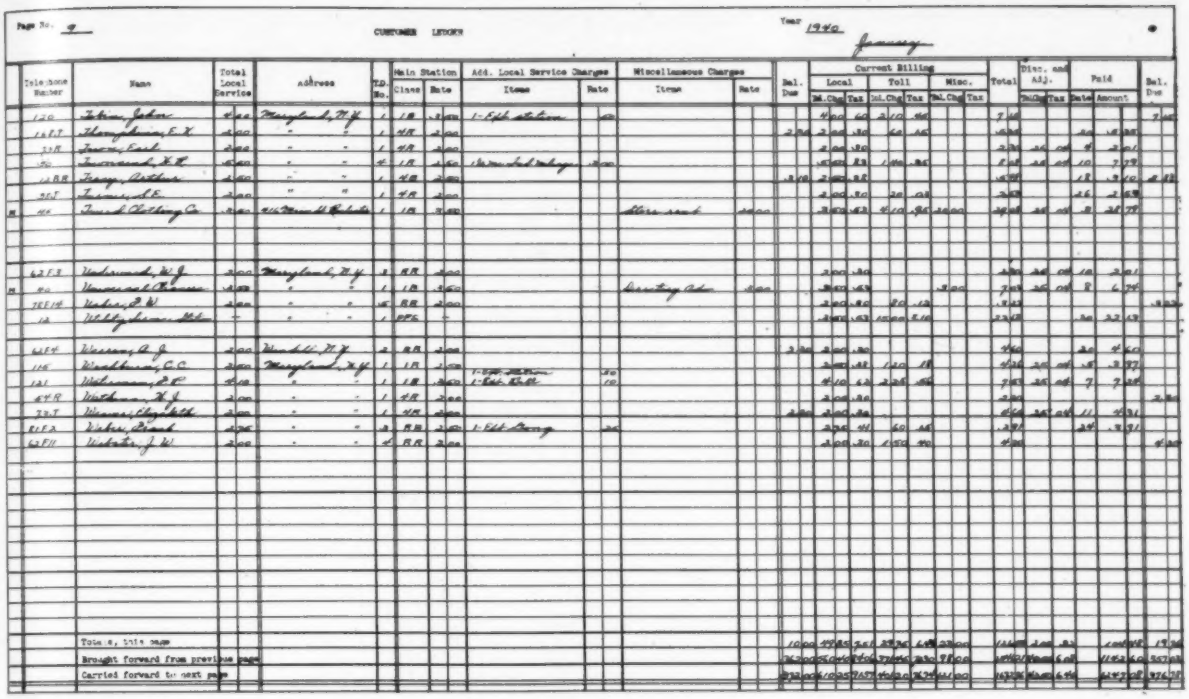
This talk is also directed to the accounting personnel of the larger telephone companies with the thought that they may be able to accomplish in their community what has been done in the states of New York and Pennsylvania. We believe it is the duty of the larger telephone companies to lend assistance to the small companies in their neighborhood, even to the point of taking the time and effort to actually put a system like this into operation and to follow it through in later years to see if the system is working properly.

During the past 10 or 12 years, it has fallen to my lot at different times, to be chairman of the accounting committee of our state associations in New York and Pennsylvania. We realized the need of proper accounting for small telephone companies and decided that something should be done about it. On several occasions we have conducted one to three-day sessions and invited all of the smaller companies, as well as representatives from some of the larger companies, to be present. We presented this simplified system with certain specimen entries which these people entered on the forms themselves. The reason for doing this was to get them acquainted with the actual operation of the system and inspect their work to see if they had made the entries in the proper manner. Today 38 or 40 small companies are using this system with very little difficulty.

Of course, in my talk today, I can touch only on the high-lights of this system. Through the kindness of Mr. Hinman, we have about 200 sets with sample forms, some with specimen entries made thereon. He has prepared routine instructions and explained every operation. If you have not been supplied with a copy, it will be available at the close of the meeting, or *a copy will be mailed to you if our supply is exhausted.*

R. E. Casselman of Sanborn, N. Y., operates a small telephone company in that village and also runs a printing plant on the side. He consented to print a complete set of these forms and put them into binders 11 ins. x 17 ins. of any Class D company for a period of two or three years. These binders can be obtained from Mr. Casselman complete with forms for the sum of $11.

The first page of the booklet contains some introductory remarks regarding the necessity and objectives of keeping a bookkeeping system. As Mr. Hinman says, "Bookkeeping reduced to its fundamentals is keeping account of where money comes from and where it goes." He told me the biggest obstacle he encountered in designing this system was to overcome the prejudices of



Page No. 9 — CUSTOMER LEDGER — Year 1940 — January

Telephone Number	Name	Total Local Service	Address	T.D. No.	Main Station Class	Main Station Rate	Add. Local Service Charges Items	Add. Local Service Charges Rate	Miscellaneous Charges Items	Miscellaneous Charges Rate	Bal. Due	Current Billing Local Del. Chg	Current Billing Local Tax	Current Billing Toll Del. Chg	Current Billing Toll Tax	Current Billing Misc. Del. Chg	Current Billing Misc. Tax	Total	Disc. and Adj. Del. Chg	Disc. and Adj. Tax	Paid Date	Paid Amount	Bal. Due
120	Allen, John	4.00	Maryland, N.Y.	1	1B	2.00	1-Fish station	.50				4.00	.60	2.10	.06			7.16					7.16
1217	Humphrey, C.K.	4.00	" "	1	4R	2.00					2.76	2.00	.30	.60	.06			4.96			2-10	4.86	
118	Jones, Carl	4.00	" "	1	4R	2.00						2.00	.30					2.30	.06	.06	2-1	2.01	
50	Lamond, K.H.	4.00	" "	4	1B	2.00	1-Automobile	.50				4.00	.83	1.00	.06			5.89	.06	.06	10	5.77	
1188	Rapp, Arthur	2.00	" "	1	4B	2.00					3.10	2.00	.30					4.90			12	4.90	3.10
307	Turner, A.E.	2.00	" "	1	4R	2.00						2.00	.30	.20	.02			2.52			26	2.52	
41	Trend Clothing Co.	2.00	41 Main St. Hubbell	1	1B	2.00			Store rent	10.00		2.00	.63	4.10	.96	10.00		19.69	.06	.06	8	19.57	
6213	Underwood, W.J.	2.00	Maryland, N.Y.	2	8R	2.00						2.00	.30					4.30	.06	.06	10	4.08	
20	Underwood Store	4.00	" "	1	1B	2.00			Laundry Adv.	6.00		2.00	.63			2.00		7.63	.06	.06	8	6.96	
7218	Vahe, P.W.	4.00	" "	15	8R	2.00						2.00	.30	.90	.12			3.32					3.32
12	Valleydew Mfg. Co.		" "	1	DPC							2.00	.63	10.00	2.10			22.73			30	22.43	
6214	Varney, A.J.	2.00	Hubbell, N.Y.	2	8R	2.00					2.30	2.00	.30					4.30			20	4.10	
116	Washburn, C.C.	2.00	Maryland, N.Y.	1	1R	2.00	1-Extension	.50				2.00	.42	1.10	.18			3.70	.06	.06	18	3.52	
121	Wilkinson, P.C.	4.00	" "	1	1B	2.00	1-Ext. Bell	.50				4.00	.63	2.20	.06			7.89	.06	.06	7	7.71	
6218	Watson, N.J.	2.00	" "	1	4R	2.00						2.00	.30					2.30					2.30
307	Wiener, Clydelle	2.00	" "	1	4R	2.00					2.30	2.00	.30					4.60	.06	.06	11	4.34	
6213	Vahe, Frank	2.00	" "	2	8R	2.00	1-Ext. Phone	.50				2.76	.41	.60	.18			3.95			24	3.71	
6211	Vahatis, J.W.	2.00	" "	2	8R	2.00						2.00	.30	1.10	.06			4.46					4.46
	Total, this page										10.00	47.85	7.61	25.76	4.08	23.00		118.30	2.00	.82		108.96	19.36
	Brought forward from previous page										76.20	25.45	3.90	72.36	9.30	57.00		244.21	4.00	1.62		224.24	52.36
	Carried forward to next page										86.20	73.30	11.51	98.12	13.38	80.00		362.51	6.00	2.44		333.20	71.72

Customer Ledger

accountants, who were so set in their ways that they would not try anything except the orthodox debit and credit of double entry bookkeeping. This system really is a double entry system, but is set up on a record-keeping basis rather than on a bookkeeping basis.

Most Class D companies have no general ledger. They prepare a report to the public service commission at the end of each year. This report requires them to enter in certain columns their assets, consisting of the dollars they have invested in plant, accounts receivable, and the cash on hand or in the bank; also their liabilities, the amount of capital stock, depreciation reserve and surplus or deficit. This is their balance sheet.

Mr. Hinman's system does not provide for any general ledger but merely provides a means of recording the changes which occur during the year. He has designed two sets of columnar sheets, which he calls ledgers. The Customer's Ledger provides a record of subscribers, their telephone facilities, billing, payments, discounts and allowances, accounts receivable and uncollectible operating revenues. I imagine most of you have a customer's ledger, or ledger cards, which shows this same information. The forms exhibited in this booklet, if properly maintained, will furnish a very complete record of revenues from this source. The other ledger he calls the Disbursement Ledger. This form provides a record of all expenditures for maintenance, operation, construction of telephone plant and other purposes.

In addition to these two basic records, the system employs the three following supplemental forms:

Revenue Summary: This form is an additional sheet in the front of the subscriber's ledger section of the loose leaf binder. It provides a monthly and annual summary of all of the entries in the Customer's Ledger.

Salary and Wages Summary: This record, kept on a page in the back of the loose leaf binder, is required by the federal social security tax regulation. This form has been so designed that the weekly wages of employes may be combined for entry in the Disbursement Ledger and that data for old age benefits tax, federal income tax withholdings and unemployment insurance tax reports may be readily available. From this summary these reports can be easily prepared.

Weekly Labor Report: These are pocket-size cards on the face of which the plant employes record the division of their time between maintenance, operation and telephone plant activities, and on the reverse side record the units of property installed and retired.

On the next page a complete description of entries in the Customer's Ledger is given, showing what information should be entered in each one of the columns on this sheet. This explanation is so complete that further explanation of this ledger is unnecessary.

On page three, Mr. Hinman mentions that ledger cards may be used in place of these ledger sheets, if you so desire. He points out that cards have the advantage of being somewhat more flexible, but the use of the pages have the advantages of compactness, portability and having all of the company's accounting in one book.

Page four and also the printed sheet just before the last page in the booklet, the layout of the Disbursement Ledger is given. The Disbursement Ledger provides a simple means of recording and distributing expenditures to the proper maintenance, operation, telephone plant and other accounts by simply entering such information in the proper column. In the Disbursement Ledger are recorded only the day-by-day transactions which occur during that year.

On the printed sheets there are certain specimen entries, which cover every kind of a transaction that a small company would have during the year. Pages four and five give such a complete description of these entries and the proper columns into which to enter same that I will not take the time to go into a detailed explanation.

Of course, you can do as you please regarding the keeping of a General Ledger. In the small company which we operate, we took an inventory, priced it out and made up a balance sheet as of the date we began opera-

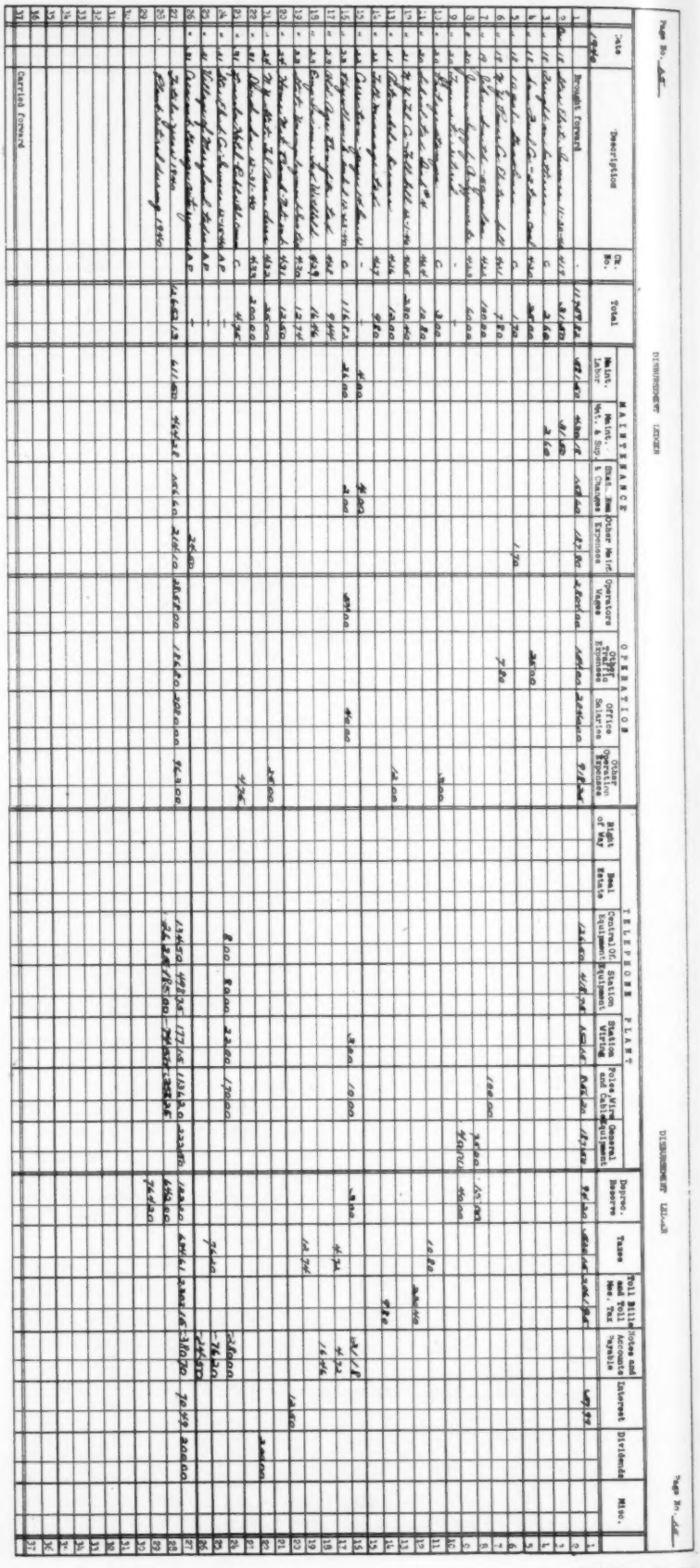
tions. We then purchased a low priced ledger with standard ledger sheets in a ring binder. We operate this system on a quarterly basis and close out the accumulated totals into these ledger sheets at the end of each quarter. In this way we can make up a revenue statement four times a year. This is one instance of where an accountant feels that he can make this system look a little more like a complete bookkeeping system, although it is not necessary to do so. Most of the smaller companies accumulate these entries for the entire year and prepare a new balance sheet by recording the net changes during the year.

On page six, there is a discussion of Mr. Hinman's ideas regarding the handling of materials and supplies. He recommends that all materials and supplies be charged to the account for which they have been purchased as soon as these materials have been received and paid for. In the uniform system of accounts in our state, it is not compulsory to carry materials and supplies in a materials and supplies account and we can see no reason why a small company should do so. When material is purchased, the operator of a Class D company knows pretty definitely where that material is going to be used. If he should use it for any other purpose than originally intended, he can easily transfer the amount of such material from one column to another with a red and black entry.

No doubt, this method of handling materials and supplies will cause a lot of controversy among some of you "dyed in the wool" accountants, but it has been necessary in setting up a system of this kind to take a broad view with respect to some of these practices. In the final analysis, it does not seem to make much difference whether materials and supplies are left in the storeroom or pole yard or whether they are charged directly to the plant account. If, at any time, one desires to determine the amount of plant in service, he can do so very easily by taking an inventory of materials and supplies on hand and deducting same from the entries made in the Disbursement Ledger.

If the question of a proper rate should arise, we all know that the total plant in service is computed and a fair allowance is made for working capital, which includes materials and supplies, so what difference does it make if the materials and supplies are charged directly to the accounts where they will eventually be used? Small operating companies are not apt to be overstocked with supplies.

Referring again to the Disbursement Ledger, there are certain entries which provide for the purchase of new equip-



Disbursement Ledger

ment and the method of handling the salvage from old equipment which is traded in. There also is a note at the foot of the page entries which record the total value of all units of plant which have been removed from plant during the year. In a small company it is not necessary to record week-by-week installation of plant units and the retirements. These are recorded on the reverse side of the weekly Labor Report and are summarized at the end of the year, or quarter as the case may be. A method has been provided for summarizing reusable material. The method of retirement of plant is to enter the total value of all the units retired in red below the totals of the construction charges for the year and a like amount in black in the depreciation column. On page seven of the booklet, instructions are given for handling such items as notes and accounts receivable.

WEEKLY LABOR REPORT

Name _____ Ticket No. _____

Week ending _____ Hourly Rate _____

	Maintenance Labor	Station Removals & Changes	Telephone Plant			Plant Removal Labor	Office Salaries	Totals
			Central Office Equip.	Station Wiring	Poles Wire & Cable			
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Total Hours								
Amount								

Weekly Labor Report

Although the system is intended to be on a cash basis, rather than accrual, certain transactions can be entered on these forms, which will give the correct answer without the immediate payment of cash by using the "Notes and Accounts Payable" column. In order to get a correct statement of the expenditures for the year, it is necessary to list the unpaid current bills of any importance in the Disbursement Ledger. You can distribute the bill to the proper expense or telephone plant column and enter such amounts in red in the "Notes and Accounts Receivable" column. Mark such bills "Distributed" to avoid duplication of charges when the bills are paid. Later when such bills are paid, make similar entries in the "Description" column, note the check numbers, enter the amount paid in the "Total" column and charge such amount in the "Notes and Accounts Receivable" column in black.

The question of setting up the proper reserve for depreciation should be considered when closing the books for the year. This is a simple entry, which can be made at the close of the year, or quarter, whichever period you are going to use. Most of the smaller companies find that a composite rate of 4 per cent is sufficient to apply to the total investment in plant. This means an average life of about 25 years. In case you are contemplating a cut-over to dial operation, it will be necessary to estimate the net amount of plant to be retired. That would be the book value of plant, plus cost of removal, less salvage. Then deduct your Depreciation Reserve and find out how much more depreciation you must accrue before the cut-over. Divide this amount by the number of years remaining before the cut-over and accrue this amount each year.

Mr. Hinman has outlined certain methods of proving your work after all entries are made and the columns have been totaled. Each entry in the Disbursement Ledger must balance within itself. Therefore, the grand total of all distribution column totals at the bottom of each page should equal the "Total" column total.

The cash balance may be checked at any time by taking the cash on hand at the beginning of the year and adding the total of the "Payments During Month" and "Other Receipts" from the Revenue Summary, then deducting the total of Disbursement Ledger "Total" column. The result will be the Cash Balance at present.

OUTSIDE PLANT INSTALLED

Plant Units	TD	TD	TD	TD
Poles				
Iron Wire				
Copper Wire				
Tw.Pr. Wire				
Cable				

OUTSIDE PLANT RETIRED

Plant Units	TD	TD	TD	TD
Poles				
Iron Wire				
Copper Wire				
Tw.Pr. Wire				
Cable				

REUSABLE RETIRED OUTSIDE PLANT MATERIAL

Poles	IronWire	Cop.Wire	TwPrWire	Cable

EQUIPMENT, INSTALLATIONS AND DROP WIRES JUNKED

Telephone (comp.)	Desk or HandSet	DeskSet Boxes	Install. Removed	DropWires Removed

Other Plant and Equipment Changes _____

Outside Plant Installation

A very simple method of recording salary and wage information is presented on page nine of the booklet. You may not agree that this is good accounting practice, but you must admit you cannot help but arrive at the correct answer after these withheld taxes are paid.

The Weekly Labor Report is where most companies have difficulty. However, if the simple form is filled out every week, it will be very easy to make the summary at the end of the year. This form provides spaces for the recording of the number of poles (irrespective of size or kind) and the quantities of wire and cable installed and retired. No other items of outside plant need be recorded. Station apparatus is retired only when junked, and station installations and drop wires only when removed from subscribers' premises or abandoned. No entry should be made for installation and drop wires at location where it is probable that service will be re-established.

Of course, it takes a little time and effort to keep up these simple forms, but think of the results you will obtain. Think of the headaches you will save about March 15. Your federal income tax will be a very easy problem and there will be so much less labor in making out this or any other report if you have the data properly recorded and summarized. Without proper accounting you may be paying more taxes than you should. The fact is that this system protects you from those suspicious income tax examiners. You will make money by keeping proper records, or at least you will know when you begin to lose money. You can justify proper rates. You can

(Please turn to page 95)

One of the features of the convention was the manufacturers' forum on "What the Manufacturers Are Doing to Help Meet the Service Situation." Representing the manufacturers were their presidents. R. A. PHILLIPS was the moderator. Those participating in the forum are (left to right): A. C. REID, Leich Electric Co.; J. H. KELLOGG, Kellogg Switchboard & Supply Co.; F. R. McBERTY, North Electric Mfg. Co.; MR. PHILLIPS; W. J. CAVERLEY, Automatic Electric Co., and DR. R. H. MANSON, Stromberg-Carlson Co.

WHAT MANUFACTURERS ARE DOING TO HELP SERVICE SITUATION

THE manufacturers' panel on "What the Manufacturers Are Doing to Help Meet the Service Situation," held during the last session of the USITA convention, was one of the highlights of the convention program. R. A. Phillips, Sioux Falls, S. D., was the moderator and the principal telephone manufacturers were represented by their presidents, namely: W. J. Caverley, Automatic Electric Co.; J. H. Kellogg, Kellogg Switchboard & Supply Co.; A. C. Reid, Leich Electric Co.; F. R. McBerty, North Electric Mfg. Co., and Dr. R. H. Manson, Stromberg-Carlson Co.

Mr. Phillips opened the panel by stating that the rendition of telephone service to meet the increasing demand of the public is the keynote of the Independent telephone industry and to meet that demand it is necessary for operating companies to secure sufficient equipment to expand their plants. Therefore, he said, the manufacturers were asked to tell of the difficulties they have faced and are facing to convert their facilities from wartime to peacetime production, notwithstanding the shortage of basic materials and manpower.

The moderator stated that the production and placing in operation of telephone equipment is one of the biggest problems facing the industry and that it must be solved on the basis of cooperation between the operating companies and manufacturers.

With these opening statements, Mr. Phillips called on Mr. Manson to tell of the problems involved in converting a telephone manufacturing plant from the production of war equipment to that used by civilian telephone companies. (A running report of the panel follows.)

MR. MANSON: . . . As you know, this global war that we have just completed depended on communications, communications from the White House, from the heads of all the governments involved, clear down to the firing line and beyond the firing line and behind the front lines.

The war brought problems to the telephone manufacturers the same as to other manufacturers. We had limited space, so one of the first things we had to do was to provide the space.

Second, we had to provide the means of action and machinery for producing material. Most of us had pretty good machinery for producing in limited quantities, but for this all-out production, we ran shy some 1,200 per cent.

Sometimes it was necessary to put in new equipment, better machinery that would produce in bigger quantities and with better accuracy. You could not waste material. Then we had to revamp our plants, change them over quite a little bit. We had to put in test equipment which was entirely new to the telephone industry. . . .

Some of the equipment we made was very similar to equipment required in peacetime, other types were quite different. Some of us had to make radio types of equipment, some confined all of their work to the straight wire level, but regardless of the types of equipment, requirements were all the same.

The first and foremost requirement was servicability and the second was to get it there and to get it there quickly.

We have the same requirements now in peacetime, but the government was paying the bill during the war and we introduced all kinds of plans and schemes to get equipment, materials and to get labor. We set up schools to teach operators — some were grandmothers. . . .

Those facilities, that type of equipment, all have been carried into the postwar period. . . . We know we did a good job, a big job during the war. We helped to win the war by helping to furnish the communications equipment.

We have been asked to do a great big job after the war.

During the war we would work 24 hours a day in three shifts. Then people worked three shifts. They don't want to work three shifts now. We had an ample supply of labor. Material was hard to get, but we did get it. We had priorities to help us out. We have no priorities now. We are entering into a period where there is scarcity, restrictions and difficulties in other industries —not our own—holding us up, but in spite of that, I want to assure you that we are doing a big job and I am sure you all realize we are doing a comparatively good job. I think we are doing a better job than we did for the armed forces during the war.

CHAIRMAN PHILLIPS: We all know that while Mr. Manson brought up

some more problems, he also brought up some more ideas. Undoubtedly a good many of the ideas will be helpful to us in our industry.

I would now like to ask Mr. McBerty to say a few words to you. I think you all know that Mr. McBerty is generally recognized as one of the leading technicians in the telephone industry and a well-known inventor.

MR. MCBERTY: The work which was thrown on the telephone manufacturers at the outbreak of the war was radically different in many particulars from the equipment that was being made before. Many modifications were required; many new men had to be put on the job. That occupied about five years and during those five years the manufacturers of telephone equipment were under the demand of the government. . . .

That had the advantage of giving them a priority in respect to getting equipment, poles, materials, etc., as were needed by the government, but they diverted the equipment and tools from the normal processes into the unusual processes required by the government.

At the end of about five years that war suddenly terminated. It was then necessary not only to provide the things that had been developed, but to return to equipment that was being used in industry. That meant a return to the normal operations of five years before and the discarding of tools and other equipment used during the war. . . .

The first question was that of materials. The government had commandeered all the materials that were being used for government purposes and we had to get from such places as were possible the various materials, which were very numerous, that were required for the new range of standard materials for the current consumers.

That required, among other things, a very large increase of investment. It was necessary to get materials where and when you could get them and have them in storage for use in the regular current business. That required many hundreds of thousands of dollars.

You bought materials where you could; you got them from any sources that were available. You stored them away until you could use them. . . .

In addition, too, much of the inventory had already been asked for by the government. That was turned back in some cases to the government, but in most cases it was turned back to the manufacturer to see how he could dispose of it and to cover the cash that he had put into the government equipment and use it for purchasing new materials for the new equipment. Those were major difficulties.

There was also the destruction of tools which represented hundreds of thousands of dollars investment, which had been worn down by the equipment which had been made for the government. Another point was that the government was very slow in releasing the equipment which the government might or might not require.

That involved long delays. One of the difficulties was that the consumers had to be gotten out of the habit of having equipment ready and waiting for their use. The supplies had been exhausted. They did not know that so they were astonished to find the equipment which they had been able to buy through many years was not available and that new tools would be required to make them up.

Another point arising out of that was that the consumers who you might remember are the people who are using telephones, operating telephone systems, through some 6,000 or 7,000 companies, had no records of what they needed and they could not tell the manufacturers what quantities of apparatus they would have to have for reinstating their service. That caused long delays.

It was fairly well estimated or found that, instead of taking a few weeks to make ready under the new conditions, it would require a year, in many cases. . . . In the meantime the order was on the books and the customer would get impatient to supply his users and that caused a good many incidents of dissatisfaction to arise.

Now, I'll give a definite case from my own company. The character of the help, the employes, had changed greatly during the war. Early in the war it was possible to get several hundred new employes quickly or to recover old employes. . . . There were thousands of items of equipment to be gathered together again.

In our own case we immediately filled up the factory to its utmost, got all the tools into operation at the earliest possible time and that, in itself, required a great deal of preparatory work.

We built one factory quickly, at our expense, in a town where there was available labor, and got that labor trained (and it takes about six months to train workmen—male or female). We got them going and threw that factory into service. . . . It was in a town of about 8,000 people. The town had very little labor used for enterprise within the town. The employes were gathered in other neighboring towns and went from 20 to 30 miles to get to their work. We had to get living quarters for the factory as it was being equipped. When that was done we got them all back to their places in town and built up very rapidly a highly efficient organization within a few months. . . .

But this was not adequate. We went searching through the country as far as Colorado and to the East in scores of places for plants that might be used, but we found only one plant. We continued the search and in six months found other plants. We chose the best of those plants and began to equip them and we now have reconstructed two other factories.

In developing these factories we had to gather the people who were available, farm boys and boys back from the Army and all sorts of odds and ends. We had to gather those together and train them. . . .

You can imagine how much work has been done. It was performed within three months. There was no delay. There was little waste of time. We devoted all out time—we are doing no other business than that—we are devoting all our time to making ready for our customers. . . . We spent all the money we could and we are now getting to the point where we will soon begin a large output of telephone apparatus.

CHAIRMAN PHILLIPS: I think, as I heard a great deal of conversaiton from these men yesterday, Mr. McBerty has outlined the kind of condition and situation they have all been facing.

I would like to ask if any of you people could foresee VJ day?

Mr. Caverly, I would like to ask you to make a few remarks as to what happened on VJ day.

You had problems before the war brought its problems. Give us a little idea, if you will, as to what the situation was at VJ day.

MR. CAVERLEY: You will all remember how, when VJ day came, the whole country looked forward with great enthusiasm to an immediate resumption of civilian production. After four years of producing for war, we were finally going to be able to make all the things we had been waiting for, including telephone equipment. And we were going to make them on a scale never before reached in peacetime history.

It is now a matter of common knowledge that the goal we sought then is still a long way off. In all industry, production is still lagging far behind needs. That is the situation which telephone manufacturers, like all others, are now facing. Naturally, you want to know why.

To find the answer to that question, let's go back to VJ day for a bit. For four years, the manufacturers' production lines had been geared to the making of communication equipment for war, most of it of such a nature that telephone companies could not use it. But the end of the war did not mean the end of war production, nor did it mean the end of wartime controls.

Our first job was to find out which of the many types of war equipment had to be continued in production, which were to be stopped abruptly, and how much of the work in process had to be carried through to completion. This would have been difficult enough even if it had been a matter of clear-cut government decision in each case. But it was anything but that. In many cases contracts were cancelled and reinstated several times over, each time on a different basis, making the situation worse than if there had been no cancellations at all.

Only those who have been intimately concerned with these termination problems know of the confusion and delay which they entailed. The net result was that abrupt conversion to civilian production was out of the question. In our case, in spite of our best efforts, it was close to the end of last year before the bulk of our war production was out of the way, and the decks really cleared for action. In the meantime, production to meet telephone company needs could be established only very gradually and on a very limited scale.

With the wartime job behind us, we found that we had disposed of one set of problems only to be faced with

Engineering Library

others just as critical. One of the more difficult of these was the matter of inventory controls, which were imposed by WPB during the period of war production, and which have since been continued, with some modifications, under the supervision of the Civilian Production Administration. This is one of the reasons for the well-known shortage of materials which you have heard so much about, although it is far from being the most important reason.

This was just the beginning of our real troubles. Since the beginning of this year, there has been a constant succession of strikes and work stoppages of various sorts in basic industries—first steel, then coal, then various other basic products without which no industry such as ours can continue to operate.

To the layman, it might appear that a four-week steel strike would entail only a four-week lag in production for manufacturers like ourselves. That is a long way from being true. In our industry there are very few items that we use in sufficient quantity to order in mill runs. Our production requires the use of more than 500 different steel products for which we are largely dependent on warehouse stocks. This meant that, before a normal flow of materials to us could be resumed, the warehouse stocks had to be built up.

Even more damaging than the strikes in basic industries were the scores of work stoppages among small suppliers throughout the country, news of which did not often reach the public press, but which in the aggregate have militated against our production much more than the widely publicized strikes.

As a result of shortages in various items, such as steel, brass, cotton, plastics, copper wire, etc., we have at times been hard pressed to keep certain departments running to anywhere like normal capacity. It may be difficult for you to understand why we have to send one of our buyers half way across the country to find simple items like machine screws, or wire and tinsel for conductors, yet that is a fact. And these shortages are continuing to hamper our efforts.

Adding to the difficulties which have grown out of material shortages are those resulting from the shortage of manpower. There was a belief common throughout all industry that the end of the war would see an ample supply of production and engineering personnel. As it turned out we found it more difficult to obtain personnel after the war than we did during the war, and that has been the common experience throughout all industry. The reasons appeared to be that war-tired people wanted to rest and upon being released from war jobs simply took a vacation. Being compensated meanwhile by unemployment insurance, they were reluctant to resume positions in old established industries where wage rates had not been inflated. One need only glance at the help wanted pages in the daily papers to realize that the labor shortage is greater today than at any time in history.

Ever since the end of the war, too, there has been an appreciable letdown in the enthusiasm which was sustained during the period of war production—a letdown which today is manifested in a high rate of labor turnover, absenteeism, and a general lowering of individual productive effort. This is not the time or place to raise the question as to whether these things are justifiable. They are simply facts which we all have to face.

Here is another fact which I think may strike closer to the experience of the operating companies. There was a general feeling in the industry that with the end of the war both the wartime traffic and the wartime demand for telephones would diminish. As you know, what has happened has been just the opposite. Both local and long distance traffic, and the backlog of unfilled orders for services are today at the highest level in all telephone history. That is why we in the manufacturing end of the industry have put our first efforts behind the supply of equipment needed to care for held orders for service. That means, of course, that deliveries on orders for new central office equipment for conversions have had to lengthen.

How soon these conditions will improve is anybody's guess. There are, I am glad to say, some indications that an improvement is on the way. But under the best of circumstances it will take some years before we can expect to strike a balance between production and the needs of the industry. In the meantime, it may be comforting, even if not especially helpful, to remember that other industries are faced with the same problems, and with many of them the situation is much more serious. If you doubt that, just think for a moment how difficult it is today to build a house, or buy an automobile, a refrigerator, a white shirt, or even a package of soap flakes, and you may conclude that the telephone industry is doing a pretty good job after all.

CHAIRMAN PHILLIPS: In order to avoid too much repetition, because I am sure you all here appreciate each one of these men representing factories and plants have very common problems.

I am going to ask Mr. Reid if he won't say a few words to give us an indication as to how the operating people themselves, can help you in your problems, which in turn will help us get that service that the public is demanding.

MR. REID: You gentlemen are agreed that as far as the fighting went, we won the war. How? By our tremendous output of munition and complete cooperation with our allies. Possibly we need some of this cooperation in our industry.

In spite of strikes, slow-downs and the war-weary American workman, our present output of equipment of all kinds is very great. The demand, however, is so unlimited that no industry can hope to sell its orders currently.

The manufacturers of telephone equipment were budgeting their probable needs for VJ-day. They placed orders for steel, brass, copper, wire and all of the material before the flood of orders started.

I wish to point out that placing of orders by manufacturers for raw material led to allotment by suppliers. We get certain quantities of steel, brass, copper, wire, etc., per month—sometimes more, sometimes less. We obtain raw material in competition with all the other industries of the United States. I believe we get our share.

You see the problem. Limited raw material and labor but a fairly equitable distribution by the cooperation of all concerned.

I am not going to tell you what you should have done to assist the manufacturers, but what you can do now.

The operating companies can assist the manufacturers in filling their pressing orders by budgeting their 1947-1948 requirements now. Place your orders and prorate the required delivery monthly until the order can be conveniently filled completely. This procedure will speed delivery of your order and also give your neighbor a chance to get some equipment. Your careful budgeting and prorating of orders will permit the manufacturer to expedite certain material and plan a better schedule of manufacturing.

Although I have not specifically stated, I have been referring to standard equipment. With manufacturers practically at capacity production on standard equipment, it is more than necessary that you schedule all equipment to be built to specifications at a very early date.

There seems to be a very serious personnel problem in the technical branch of the industry and as a result special equipment is retarded and designed. It is also difficult to schedule the parts when machinery is so loaded on standard requirements. Keep your specifications to standard equipment and circuit wherever possible.

CHAIRMAN PHILLIPS: We are all a bit more familiar with the problems of trying to get an extra telephone and some circuits and perhaps there are angles to your production that we should know a little more about.

I'm not sure, Mr. Kellogg, that some don't think we just send our orders to you and you just throw them out of the window. Could you tell us what happens?

MR. KELLOGG: I have often wondered what the customers think happens to their orders, even in normal times and I'd like to take just a couple of minutes to try to explain the process the manufacturer—I speak of a typical manufacturer—uses in making a shipment.

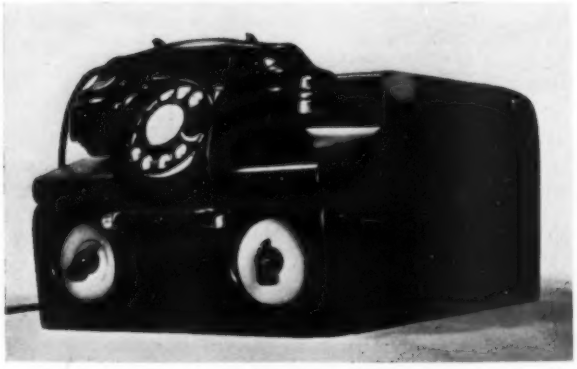
Let us say that the order comes in and is delivered immediately to what we call the order department. The order department is really a group of highly skilled men, sometimes ladies, who translate your names into factory language.

What comes out of the order department is known in the trade as a shipping ticket, or a master identification paper for that particular order and it is used as the identification for the order all the time that the order is in the manufacturer's hands.

Copies of the shipping ticket are then sent to the storerooms which will be involved in filling that order. The manufacturers, for the sake of simplicity have divided their storerooms,

NO MORE . . .

"THEY DON'T ANSWER"



THE PEATROPHONE

The "Mechanical Secretary"

- Answers the telephone; speaks a message to the calling party; records the incoming message.
- On duty all the time to answer calls and take messages in the subscriber's absence.
- Records two-way conversations.
- Meets requirements for recorders as outlined by F. C. C.
- Furnished only to telephone companies.
- New Model F combines telephone and recorder in one desk instrument.
- For magneto or common battery, manual or automatic.
- Material shortages prevent production of this new model immediately, but we will be glad to tell you about how it will make money for you and improve your service.
- The Peatrophone is covered by many patents issued and pending, and is the original and only commercial device offered the U. S. telephone industry for automatic answering and recording service in connection with subscribers' telephones.

TELEPHONE ANSWERING AND RECORDING CORP.

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or stock rooms, as we call them, into sections; maybe one for telephones and telephone arms and another, maybe, for switchboards and switchboard parts and a third one, perhaps, for piece parts. There may be another storeroom for raw materials and another for precious metals.

If, upon receipt of the shipping ticket, the storekeeper is able to fill the item from the shelf, he does so. He picks it off the shelf, sends it to the shipping department, where it is wrapped up and is sent the way the customer specified, parcel post, freight, truck or express.

If the item is not on hand, or it is short, as we call it, then that shipping ticket goes into the stock record control department.

This stock record control department plays a very important part in any manufacturer's business. One of two things can happen in a stock record control department.

The item called for on the shipping ticket is identified with what we call a shop order, which is the manufacturing authorization placed on fabricating departments to make the item called for on the shipping ticket. Information is gathered, saying that item is assigned to a shop order, but is held waiting for raw material.

In this stock control department are the inventory records. These are usually perpetual records, carried on from year to year of which a history is built up of the swiftness of movement of the individual items. Some inventory records may have as many as 50,000 parts recorded and kept up to date daily, and when I say 50,000 parts I mean standard loaded parts, not special or slow-moving parts. Inventory today is fierce. Manufacturers have to buy far ahead. Usually in normal times they like to buy on a specific program or policy laid down by management. In some cases the manufacturers like to have six months ahead in raw material, a year ahead in piece parts and maybe six months ahead in assemblies or subassemblies.

Today, we are controlled by the government in our use of raw materials, so we are not always able to standardize on our inventory controls.

Let us get back to the shipping ticket for the item that is not available at the moment. The item is assigned to a shop order and sent back to the stockroom involved where it is placed on file and placed on a follow-up list. None of us are just satisfied to leave it on the follow-up list. We have a scheduling department and one of its functions is to see that that shop order is processed swiftly through the shop departments and into the stock room.

We do not only do the scheduling of machines, manpower and raw materials availability paper-wise, but we actually expedite physically with a group of men and women. That is, we have what are called, "chasers." A chaser is assigned to a group of shop orders or piece parts and it is his business to follow through the department and get it into the stockroom with all possible haste. When the part finally arrives in the stockroom on the shop order it is parceled out to the shipping ticket. The shipping tickets are filled and the order is completed.

I thought it might be interesting to say a word about what happens when a customer inquires as to what has happened to his order.

Let's say you have placed an order and haven't received it or haven't heard how it is coming along, so you write or wire or you telephone into the sales department and you are told the order will be traced.

The request for information goes to the scheduling department, and the shop order upon which the part is placed is identified and the man or lady who is on it sees exactly where that piece or part happens to be at the moment. Then this expediter must evaluate the further time required to finish that part and to ship it, based upon the manpower available, on the machine capacity, on the tools and raw material, time for assembly, time for inspection and shipping and time in transit. The expediter gives that information back to the sales department who then passes it on to the customer.

There is quite a chain of events and things that must be done to trace where any particular order for any particular piece of equipment or part stands at the moment and some of the workers in the factory sometimes decide to go to the ball game, horse race or just decide to stay at home and the promise or forecast that the expediter made yesterday is thrown into confusion and he has to try over again.

I hope that with these few words you will have some better picture of what happens to your orders when they come into the various factories.

CHAIRMAN PHILLIPS: Now if you men will move up to your microphones, let's see if we can get this down a little bit figure-wise. I think it would be enlightening, for instance, if you could give us some ideas as to what you are producing today. What is your volume today compared to, say, what your volume was prior to wartime? I know that will vary by plants, but, Mr. Manson, would you give us some idea for your company?

MR. MANSON: On different items, say telephones, we might be producing today 400 per cent more than we produced before the war. As a matter of fact, we produce in 2½ months what we used to produce in 12 months.

In switchboards, we are running somewhere between 300 and 400 per cent more in production. In piece parts, I think Jim Kellogg told you of the difficulty of getting orders through plants. Mr. Reid also stated that if you confine yourselves to standard, then we can do some very large quantities, especially telephones that require special equipment, special circuits. They would not come off the line of the standard telephones. Therefore, it takes time. That has to be entered as a special item for special assembly, but in general I think that we could say that our production of all telephone equipment is running between 300 and 400 per cent. I think a good average would be 350 per cent.

CHAIRMAN PHILLIPS: Would anyone else like to add anything in regard to volume?

MR. KELLOGG: That sounds about right—3½ times more than, say, in 1940.

MR. REID: I would like to point out that these figures of around 300, 350 or 400 per cent increase in production don't mean very much, because every time we ship out an order you fellows bounce back with one that is just a little bit larger. That is why I am asking that you arrange a budget and give the manufacturers some idea of what we can expect in 1947 and 1948. . . .

CHAIRMAN PHILLIPS: Generally, what is the material situation? We hear a great deal about shortages of critical materials, lead, copper, phenol products. Would any of you gentlemen like to tell us what has happened in the case of lead? Did it completely dry up or is some other country getting our lead or what? Mr. Caverley?

MR. CAVERLEY: Well, of course, the lead situation is not only a drastic situation but a lot of our lead was imported from areas now where the conditions are such that they can't produce. From all we can find out, it looks like the lead situation is going to be bad for at least another year. Copper is improving slightly, but, as a result of the strikes in both the mines and refineries, we are still suffering, particularly in obtaining, at the right times, all sizes and dimensions, etc., of various buyers.

Cotton is very bad. Even shipping numbers, crating numbers. Plastics aren't too easy, either.

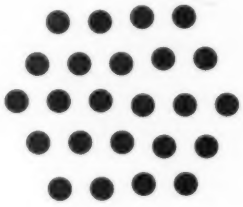
MR. MANSON: I think Mr. Caverley has answered that very well. This plastics situation can be very bad. We use plastics in making handsets. Some use it also in the bases and certainly in some of the wall sets. There was a time about two weeks ago when strikes in the plastic industry were holding up all plastic material. That is the inventory picture again. We are limited to how much we can get, but some of us by expediting have been able to keep production on handles, possibly, up to 75 per cent of what we would like to have it.

But that is the type of business we are in. We don't know from day to day what will hit us next, but through expediting we do keep going.

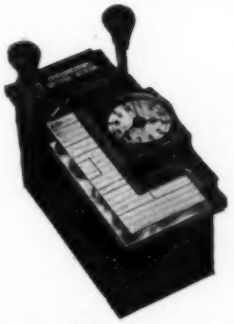
CHAIRMAN PHILLIPS: You mentioned additions to your plant for wartime production. Is this new capacity being used to its full capacity for peacetime production?

MR. KELLOGG: I don't know if I understand you.

PICTURE OF A *HEADACHE*



The dots on the left and on the right respectively represent the proportionate number of toll calls handled in the average American city just a few years ago, and today. It is evident that the problem of handling this ever-growing volume of toll traffic has become a real "headache." The Calculagraph helps very substantially by gathering the data necessary for billing purposes. For over half a century, telephone companies throughout the world have been well served by the accurate, simple-to-operate, durable Calculagraph. Today, the Calculagraph has met the test of unusual times; and that is why it continues to be the *standard* instrument for recording the starting and elapsed time of toll calls. The appearance of the switchboard model Calculagraph is familiar to almost everyone connected with the telephone industry. On this page we show a model possibly less familiar. It is finding increasing popularity in other fields — for timing piece-work in manufacturing plants, for personnel time cards in office and factory. We appreciate the heartiness of the telephone industry's endorsement of our product which has made this expansion possible. We can demonstrate our appreciation in the only way we know—by supplying you with the same fine machines that have served you so well for so long.



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CHAIRMAN PHILLIPS: A comment has been made about additions to plants during the wartime for war production. Is all that added capacity being used now for peacetime production?

MR. KELLOGG: I would say the added capacity, floor space, newer machines, new processes that resulted from the war are being used to full capacity within the limits of available labor. That is, some of us may have a machine sitting on the floor 24 hours a day, but we can't get a man to work that third shift and, therefore, it is not being used to full capacity.

CHAIRMAN PHILLIPS: Let's ask that question. What is the labor situation in numbers? How many employes do you have now, say, compared to the last peacetime year?

MR. KELLOGG: I would say double or triple.

MR. MANSON: It runs about two times or 250 per cent.

MR. CAVERLEY: We have now in excess of what we had in the years prior to the war.

MR. MCBERTY: Well, we have many more employes now. The employes in the original factory are not more numerous now than at any time in the last five to seven years. The reason for that is that the entire capacity available for service is used up for other purposes. That is, we are operating on a railroad now. The railroad has been operating under great pressure. Very few additional employes have been taken into the town. It is impossible to get any new employes in that plant and there has been practically no building.

We have two new buildings erected and in them we have added about 60 per cent of the employes and trained them within the year that I was speaking about, so the capacity is now taking account of the improved efficiency by training. We have somewhat more than doubled the number of employes within the year we have now been operating and again producing telephones.

CHAIRMAN PHILLIPS: It seems evident that you have at least twice as many as in peacetime. I would like to ask the question. Can you use any more employes?

MR. KELLOGG: I just wanted to comment about the master of ceremonies last night when he did a take-off on the Chicago radio program and talked in all the Polish languages, etc. It reminded me of some of our ads we use around Chicago, trying to get more labor. We are advertising in the foreign papers, the neighborhood papers and the big daily papers, sometimes on the radio. It is not too far-fetched, though, to think that sometime we will be advertising in Polish.

CHAIRMAN PHILLIPS: Does that take any supplies away from the Independents? Or exports or new customers? Is there anything you care to say in that regard. . . ?

MR. KELLOGG: I think mainly it is the same customers, but the customers all want many more of the same things.

MR. CAVERLEY: Well, a very much smaller portion of our total production is going to customers other than the United States Independent Telephone Association. A much smaller portion than it was in the prewar years, that is.

MR. MANSON: I can say that holds for our company, also.

CHAIRMAN PHILLIPS: Would you care to make any comment, generally? I appreciate you will differ probably —that is on expecting delivery schedules on telephone instruments other than, say, a dial office? Would any of you care to offer generally some idea as to what delivery schedules can be anticipated, say on orders being placed now? Can I get a volunteer on that?

MR. KELLOGG: It is pretty hard. There are so many things outside of our individual spheres of control that it pretty much depends on the individual company and what sources of supply you have been able to pick up and what labor you have been able to put on. That question might better be answered by interested persons asking their manufacturers on an individual basis.

CHAIRMAN PHILLIPS: Well, gentlemen, our time has about run out. I do want to say that I think it is clear to you that, as operating people, we feel we have quite a burden when we are roughly trying to serve in production or amount of business that which we did before the war. That is, any company that has more than doubled its business since 1941 is an exceptional one and yet, I think we will all agree that in the operating field we have more problems today than ever before.

I was quite impressed when these men told me that they are operating approximately as they have told you at a capacity 3½ times any previous peacetime year. I want to say in turn to them that we do believe they are doing everything possible to get us needed equipment as quickly as possible and I say to you, in turn, on behalf of the audience—don't overlook a single bet. Do everything that you can for us.

F. M. Stephens, Wisconsin Telephone President, Dies

Franklin M. Stephens, president of the Wisconsin Telephone Co. and a telephone man for 37 of his 60 years, died October 21 at his Milwaukee home. He had been ill for the last two months.

He went to Wisconsin September 1, 1945, to succeed William R. McGovern, who retired as the firm's president. Prior to his election to the Wisconsin company's presidency, Mr. Stephens had been operating vice president of the Ohio Bell Telephone Co., Cleveland, for eight years.

Among survivors are his widow, a son and five daughters.

Mr. Stephens arrived in Milwaukee in time to face problems attendant on the change from war to peacetime operation. In November, 1945, he began a five year $60,000,000 rebuilding and expansion program designed to meet the greatly increased demand for telephone service.

Since then, he has helped direct $15,000,000 worth of construction and improvement of facilities. During his year as president, the number of telephone subscribers increased from 476,900 to 535,000 and the number of employes climbed by about one-third to a new high of 10,800.

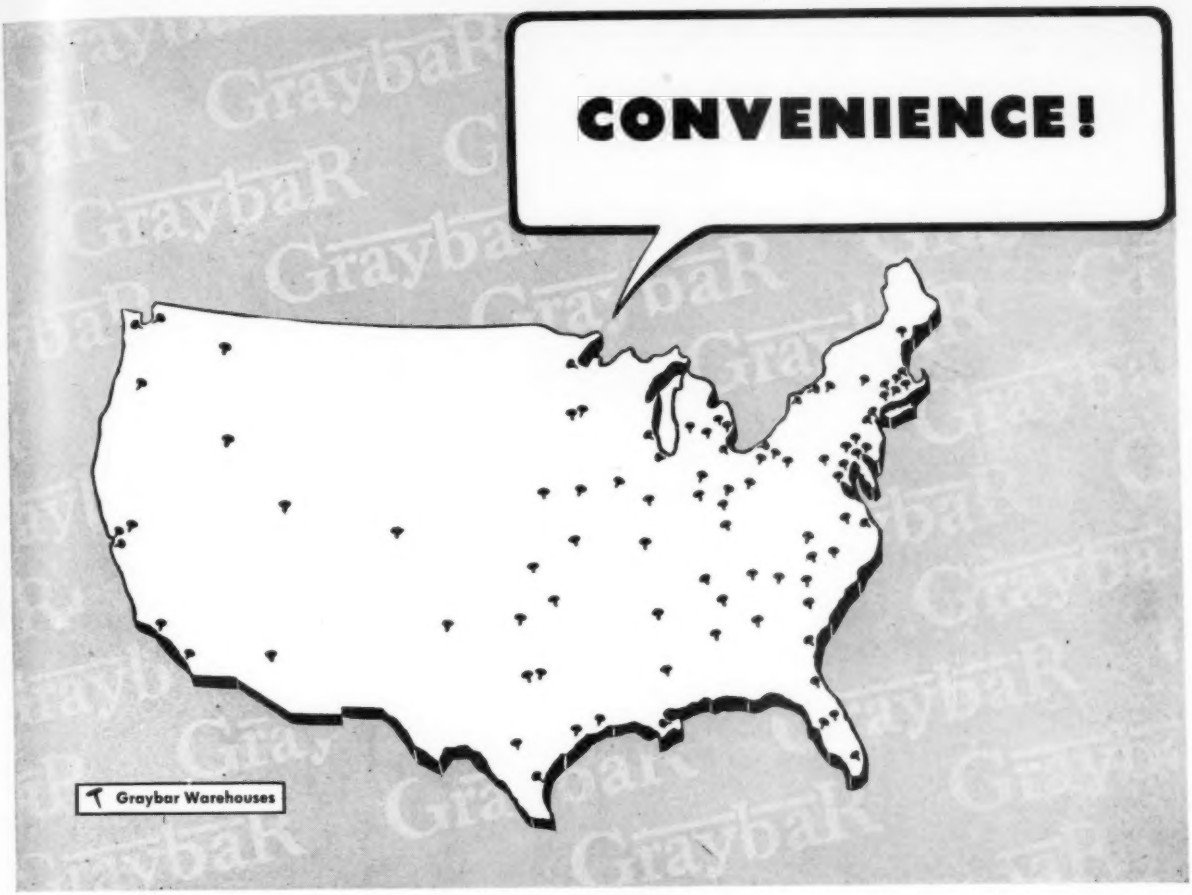
Mr. Stephens was a member of Zeta Psi social fraternity at the University of California, where he was graduated as an electrical engineer.

He was active in Red Cross work in Ohio, having served three terms as chairman of the Greater Cleveland Red Cross Roll Call and for a time as chairman of the Columbus Red Cross Chapter.

A native of Prescott, Ariz., Mr. Stephens began his career as a student engineer for the Pacific Telephone & Telegraph Co., San Francisco, in 1900.

After several years there and at St. Louis, Mo., he went to Cleveland, where he became general plant superintendent of the Ohio Bell Telephone Co. in 1923. Five years later he became general manager of the firm's southwestern area, with headquarters in Columbus. In 1929 he was elected vice-president and general manager. In 1937 he returned to Cleveland to become operating vice president of the Ohio company.

During the war he was an industrial member of the Cleveland Regional War Labor Board. Later, he was appointed one of two regular industrial members of the national telephone commission of the national WLB. He resigned this post to take the presidency of the Wisconsin company.



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Our Postwar Responsibility

(Concluded from page 24)

for the property of each company, and there are considerations of the employes of each company involved, but all of these things do not present unsurmountable conditions.

A practical plan to facilitate purchase and sale of exchange territory, with each case considered upon its merits from the standpoint of efficient and logical operation, and with due consideration for the public interest, is needed sorely for the period which lies ahead of us. I strongly urge that this problem receive the forceful attention of this association.

These are some of the more important problems facing the Independent telephone industry. They provide a challenge worthy of the best of every telephone executive.

A few weeks ago I was walking past a large construction job in a city. A number of stone masons were busily at work, and I asked one of them what he was doing. He said, "I am just putting one stone on top of another." I asked a second mason the same question and he replied, "I am working eight hours in order to get a certain amount of pay per day." I asked a third mason what he was doing, and he drew himself up and with a feeling of pride in his craftsmanship and the inspiration that comes from an understanding of what one is about, answered, "Sir, I am building a magnificent cathedral."

We in the telephone business know that the greatness of our industry does not spring alone from the mortar and bricks of its buildings, the metal of its equipment or the miles of pole line, wire and cable. It comes more, if you please, from the spirit of the pioneering of rugged individual executives, who direct the activities of our Independent companies. Because this spirit continues one of the dominating characteristis of our business, I am confident that the Independent industry will meet its postwar challenge.

Canada Economizes

A hint of postwar economy in Ottawa, Ontario, is shown in the new government telephone directory, which indicates that 1,000 government employes no longer rate a telephone.

The USITA on the Firing Line

(Continued from page 27)

If those provisions are not continued in effect, telephone companies everywhere will wish to give early consideration to the situation that will then confront them. The possibility of termination of the order suggests the desirability of making prompt contact with your state commission for the purpose of discussing the problem which will confront you if and when Order U-2 goes into the discard.

Your association through its Tax Committee expects to make an effort at the next session of Congress to obtain repeal of the excise taxes on telephone calls. The present tax rates, of 15 per cent on local service and 25 per cent on long distance service, were imposed by the 1943 Revenue Act. Under existing law they will revert to the 1942 level of 10 per cent and 20 per cent, respectively, six months after the end of the war as proclaimed by the President or declared by Congress.

It will be the aim to have the excise

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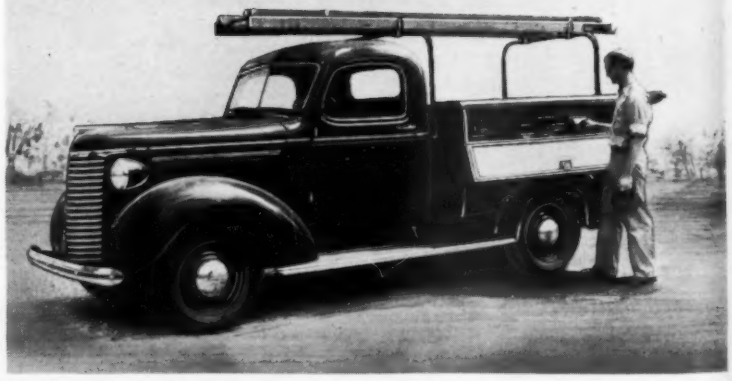

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taxes repealed in their entirety instead of merely stepping them down to their former level.

Telephone service is a business and social necessity. The excise taxes on it are in the nature of selective sales taxes. Telephone service should not, for tax purposes, be ranked with such things as cigars, liquor, jewelry, country club dues and fur coats. Such taxes are especially burdensome to the people in the lower income brackets. The levy is particularly objectionable in small towns and rural areas where cash incomes are low. . . .

I would like to mention one more matter and then I am through—taxes on business in general and their relation to private enterprise.

The tax situation, although alleviated a little by the last revenue legislation passed by Congress, is still so utterly confiscatory that there is more than a mere figure of speech in the statement that our morning mail is examined with an envelope opener, a glass of water and an aspirin tablet.

A great American in a speech before the U. S. Chamber of Commerce not long ago asserted that "our . . . free enterprise system . . . can be effectively destroyed by excessive taxation by destroying the profit incentive." That man was Sen. Harry F. Byrd who has represented the state of Virginia in the Senate for many years.

In an address in the House of Representatives a few short months ago one of the most far-visioned statesmen who ever sat in that body, a man who has been a member of it for 33 years—Democratic Congressman Hatton W. Summers of Texas—made a fervent plea for a return to fundamentals. He said that:

"By ignoring principles and the lessons of history . . . we have made vassals of our states and dependents of our people . . . we have . . . governmental confusion beyond human comprehension . . . extravagant, wasteful, inefficient . . . the destroyer of the self-reliance and self-respect and governmental capacity of the people — qualities without which no people can remain free."

As someone remarked recently, we did not wage a war to make the world safe for bureaucracy. Yet the biggest business in America today is government. It is not getting smaller. It is not going to get smaller. It is going to grow and get bigger. We have academic and bureaucratic minds, innocent of the facts of business life, eating out of the public trough by unnecessary thousands and thousands. President Jackson of the U. S. Chamber of Commerce, in referring to our sprawling, overlapping, multiplying bureaucracy, says we have an oversupply of economic screwballism.

Henry Ford, president of Ford Motor Co., said not long ago that—

"It has become somewhat fashionable to speak of making profits as if they were an un-American notion. But only out of profits can any established business get its funds for research for better things . . . only out of profits can come the capital for new tools, new plants . . . only out of profits can come higher wages, improved working conditions, and new opportunities. . . ."

The president of one of our eastern universities has cried out that ". . . in a democracy free enterprise is as essential as freedom of speech or freedom of conscience . . . (this) is not an expression of opinion . . . it is the verdict of history."

John Stuart Mill once wrote that—

"A people may prefer a free government; but if from indolence, or carelessness or cowardice, or want of public spirit, they are unequal to the exertion of preserving it; if they will not fight for it when directly attacked; if they can be deluded by artifices to cheat them out of it . . . in all of these cases they are more or less unfit for liberty."

Solving the Rural Problem

(Continued from page 20)

lowances. Other companies have found that by interviewing farm leaders and talking to rural organizations and farm groups they profitably cover an important phase of this activity.

County and state farms offer a natural opportunity to show demonstrations and exhibits on the rural program and to discuss it with the people most interested in more and better farm telephone service.

By these various means there is being told the story of how telephone companies are solving the rural problem. Telephone companies are solving the problem by installing more and more rural telephones, meantime improving the existing service as they go along.

Naturally, the growth of rural service has not followed the same pattern in all areas of the United States. Nor is it uniform throughout various units of the industry. Regardless of any individual comparisons that may be made as between individual companies or groups of companies, no single telephone company can be indicted on the charge of a lack of aggressiveness

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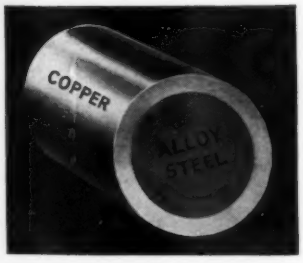

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solely because its percentage of growth fails to match that of some other company or even the average growth throughout the nation. Results must be measured on the possibilities of expansion in the particular area served. It already has been pointed out that farm income is the real key to rural telephone development. In addition to the factor of farm income per capita, the degree of saturation already attained plays a most important part in the growth record. In that area, broadly referred to as "North" in U. S. census figures, the important middlewestern farm states of Illinois, Indiana, Minnesota, Ohio and Wisconsin are included. The farm area of these states is served largely by Independent telephone companies. In this area classified as "North," 53 per cent of the farms had telephones in 1945, a figure somewhat better than the national average for farm electrification. This is somewhat of a tribute to the willingness of the Independents to serve the rural communities on an area coverage basis.

And one or two final figures gleaned from the recent agricultural census, Minnesota, with 181,550 occupied farms, is recorded as having 103,176 with telephones while only 93,342 have electricity. Here in the state of Illinois, over 62 per cent of the occupied farms have telephones—124,039 farms with telephones as compared to 120,177 with electricity. Supported by federal funds, the REA has been responsible for the electrification of many of the farms in these two states. But so far as we are able to determine, it has not required a single cent from the government's bank account to provide rural telephone service in either of those states.

There is no evidence that farm people in these states are proponents of federal intervention in the telephone field. On the other hand, these people are confident that the telephone industry can and will take care of the rural communities' needs for telephone service, primarily because the companies which serve them have given a convincing demonstration of that fact all through the years. Continued public confidence in telephone people to do the rural job without governmental intervention depends upon whether or not the entire industry promptly can show results indicating determined full-scale rural action. And every day, more and more, that demonstration is being made.

V V

Changes Operators

MRS. S. L. BORNGESSER has resigned her position as telephone operator at the Andrew County Mutual Telephone Co., Fillmore, Mo. MRS. WILLIAM RAMSEY is the new operator.

Mechanics of Dial Conversion

(Continued from page 39)

necessary to increase the trunking to handle the present-day traffic. The inadequacy of 10 per cent trunking in medium and large exchanges is merely a matter of record. The application of "time disconnect" on connectors is something which you must decide upon yourself. It enjoys a wide range in relay systems and, generally, with very few exceptions meets with public approval, but you should be warned that even with "time disconnect" 10 per cent trunking is still inadequate.

Detailed conclusions on the use of various types of dial systems are beyond the scope of this talk. It will have succeeded if it has impressed you with the general conclusion that companies, which embrace small and medium-sized exchanges for the most part, should consider relay type equipment for any application involving a small, stable community in which equipment additions will be infrequent, and which will not require trunking flexibility for changing traffic requirements. For other applications the higher capacity, more flexible machine and switch equipment should be carefully considered not only in the light of initial cost but also in the light of cost of subsequent additions.

The use of new type systems by companies should not be neglected, of course, but at the same time until obvious advantages over existing systems are apparent, due regard to the standardization problem, mentioned before, should be considered. We will all agree, no doubt, to the premise that variation with accompanying complications, for variation's sake alone, is not desirable and should be avoided. However, to bring this discussion down to earth, let us not overlook the fact that selection of equipment in this day of strikes and shortages is effected greatly by availability—a minor consideration in normal times—which perhaps should not, but actually does dwarf the otherwise more important considerations mentioned earlier.

Now in conclusion just a few words about buildings to house the new equipment.

Considering that the specifications have been quoted upon, and the make of equipment decided, then the floor plan and building dimensions are determined and turned over to the en-

(Please turn to page 91)

gineering for the building construction or alteration, as the case demands.

Small exchanges up to 600 lines capacity have been accommodated in standard type buildings. The majority of cases can be adequately and economically met by such "mass production" tactics. Thus the building design costs for the small exchange are spread over many conversions.

Large exchange buildings are designed for the specific project and features incorporated in them to meet requirements of the equipment, and of the traffic, commercial and plant departments where they are involved.

Tools; Testing Instruments

(Continued from page 56)

decibel meter, can be used to make a variety of most useful tests in any telephone exchange. These instruments provide a means of making actual quantitive transmission tests over lines as well as tests through repeating coils and other station and central office equipment.

These tests, if properly made, will prove most valuable in the rendering of good telephone service. For example, the 1,000 cycle oscillator can be placed on a line in the central office and readings taken at various points along the line with a decibel meter. These readings then can be preserved and later referred to on a comparative test.

Also, wet weather transmission over a line may be compared to its dry weather transmission qualities. No line is ever better than its wet weather transmission. Further, tests made with these instruments often disclose defects which prove detrimental to transmission and which will not be detected by the usual direct current testing methods.

The Monoset

This little acoustical set, designed primarily for use of war veterans on program systems in service hospitals, now is attracting considerable attention in the communications world. It weighs only a little over an ounce and quickly is adjustable to all head sizes. It eliminates the ear pressure and head fatigue of old-style headsets. It is available in three impedances: 128, 500 and 2,000 ohms. It is ideal for use on all testing instruments where a head receiver is required.

Lookator

During and since the end of the late war we have heard much about radar

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Stephens Climbers, manufactured by Buckingham of Binghamton for more than 45 years, have built an international reputation for safety and comfort.

Binghamton Easy Belt No. 58

Safe and comfortable, it's made of tan harness leather, lined with soft chrome lace-leather. No metal contact with the body. Forged Dee-ring and buckles are individually tested.

Why do Stephens Climbers enjoy the popular demand and confidence of utility companies, telephone companies and individual linemen?

Because Stephens Climbers, and all other Buckingham safety equipment, are made under one watchword—*quality*. Each climber is tested for safety and carefully inspected to meet the rigid standards and exacting requirements of safety engineers. Every care has been taken to provide comfortable equipment. Our patented Right and Left Climbers, for example, are a distinct improvement which adds materially to the safety and comfort of the linemen.

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AMPHENOL serves the communications field with the finest and most complete line of radio-electronic parts available from any one source. In equipment operating in the 30 to 40 mc band and the 156 to 162 mc band used for mobile radio-telephone service there are countless installations depending on Amphenol cables, connectors, conduit, plugs, sockets and fittings. Mechanically efficient, electrically correct, Amphenol components offer the longest service and the best performance characteristics known in the field today.

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and how echoes were used effectively as a means of obtaining information from a distance. Electrical echoes are known to occur within telephone lines whenever there are impedance irregularities, and it was upon this principle that a device known as a Lookator was developed for locating faults on telephone lines. This set is divided into three units: Lookator, Lookator Terminating Unit, and Lookator Hybrid Unit. This type of equipment differs from the usual fault locator in that a visible Cathode-Ray oscilloscope trace is used to determine the general condition of a circuit under test along its entire length.

The device thus is a fault locator that permits the tester, in effect, to "look" out over the circuit; hence, it seemed appropriate to call the instrument a Lookator.

This equipment may be used to locate faults on loaded cable or open wire of any gauge. Faults such as shorts, bridged resistances and leaks to ground, opens and series resistances, grounds and loading irregularities, may be located. It may be used to provide a continuous appraisal of the condition of a circuit along its entire length during installation, thus immediately learning of faults and errors.

When testing on open wire lines, maximum accuracy will be obtained when the circuit being tested consists of the same gauge and spacing throughout its entire length. If lengths of entrance or intermediate cables are included in the line, operating methods involving special consideration of the junction irregularities, or measurements to artificially produce shorts placed on the circuit at several junction points to be used as reference points, will be required for reasonably accurate results.

The Lookator, the Lookator Terminating Unit and the Lookator Hybrid Unit, serve as a means of locating line faults. The Lookator generates a pulse which is sent along the line to the fault. The impedance irregularity caused by the fault reflects the pulse which is returned to the Lookator. The Lookator receives the reflected pulse from the fault and converts it to a visual indication on the Cathode-Ray tube. The Lookator Terminating Unit provides a means of terminating the line in several ways. The unit is used by the lineman who provides the desired termination under the direction of the tester. By means of these terminations, it will be possible for the tester to determine the location of the fault more accurately.

The Lookator Hybrid Unit makes possible the location of a fault beyond the first repeater of a four-wire cir-

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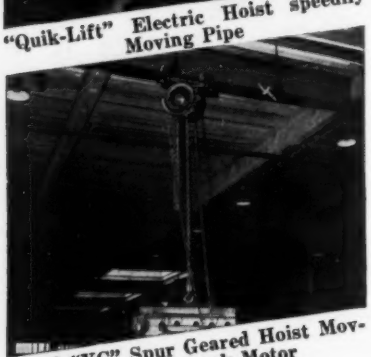

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cuit. It serves as a means of transforming a four-wire circuit to a two-wire circuit for testing.

In testing a circuit, if steady or swinging faults are present, their general nature can be detected at once, and their distance from the Lookator can be measured by a simple procedure. Knowing the speed of transmission of the pulse over the particular facility, the distance to the fault can be obtained. In practice, the time is determined automatically by the equipment. This is accomplished by properly setting a measuring dial and noting its reading. By using the reading of the dial and a previously calibrated curve, the location of the trouble then can be obtained.

Conclusion

No attempt has been made to cover all new, tried and proved tools and testing instruments in this short period. In fact, mention has been made of only a few which may be considered essential under normal conditions. It is sincerely believed, however, that good tools and testing instruments, if properly used, will in all cases prove a worthwhile investment for any telephone company regardless of its size.

Good tools make good workmen for they increase the worker's confidence in himself. Good tools also make possible a high grade of work in a minimum amount of time. Testing instruments reduce the element of guess and increase the know-how of the telephone workman in his daily tasks. Certainly, these factors are important and will contribute much toward the provision of good telephone service.

V V

J. Bergstrom New Manager At Belle Plaine, Iowa

J. Bergstrom of Toledo, Iowa, has been named manager of the Central Iowa Telephone Co.'s Belle Plaine exchange. He succeeds A. Miller, who recently purchased the Webb (Iowa) Telephone Co.

Mr. Bergstrom received telephone training while serving in the U. S. Army Signal Corps. He has been associated with the Central Iowa Telephone Co. since February of this year.

V V

R. E. Clisby Named Manager at Slayton, Minn.

The appointment of R. E. Clisby as resident manager of the Central Telephone Co., Slayton, Minn., has been announced by District Manager K. L. Rasmus. Mr. Clisby succeeds F. H. Edminster who was elevated to the La Crosse, Wis., plant of the company.

Mr. Clisby has been associated with the Central Telephone Co. since 1928.

Radio in the Telephone Field

(Concluded from page 59)

modulation (PTM) equipment to a multiple thereof as is possible when television channels (4 MC. and over) are used. Such systems have their unquestionable merits, but they are restricted to routes where large numbers of circuits are needed. For this reason, an analysis was made at General Telephone of the relative cost of wire lines and of microwave channels having one to four circuits. While the results still are tentative it may be mentioned that the cost figure for microwaves are in the same order as those for lines and that savings seem possible in many instances. Further investigation will be necessary and it is planned that they also will include field tests with microwave equipment.

Conclusion

The preceding constitutes an attempt to review the influence of radio on the telephone field. In view of its wide scope some parts were treated sketchily, and completeness certainly is not claimed. The review may, however, lead to the conclusion that radio promises to be a useful, as well as economical, tool in the telephone industry and permits a wide scope of application.

Mobile Radio-Telephone Service

(Concluded from page 60)

It seems to me that any discussion of a program for the further promotion and usage of radio-telephony can wait until another year.

The purpose of this paper has not been to cover the field of radio-telephony even to a very limited degree, but rather to try to create an interest in the subject and provide the basis for additional discussion.

V V

DuRant Changes Position

R. S. DuRant has resigned as general manager of the Polk County (S. C.) Telephone Co. to accept a position as general manager of the Independent Telephone Co. with headquarters in Marion, S. C. His resignation became effective October 2.

Small Company Accounting

(Concluded from page 73)

get a better price for your property if you wish to sell. You can prove the value of your plant at any time.

Years ago many small telephone companies were apparently flourishing but since then have gone bankrupt or have had to sell out because they did not know what was going on in their business. They knew nothing about depreciation and thought they were doing a good job because they had money in the bank. When it came time to rebuild or install new central office equipment, they realized they had used up their original investment. They had their choice of putting up fresh capital or selling out. A lot of them sold out. A little effort toward keeping better records or even a little expenditure of money for better records, is bound to pay good dividends.

V V

Telephone, Accessories Used In Advertising, Jewelry

The telephone and its accessories' modern uses are a far cry from those intended by creative Mr. Bell. Last week we saw a colored page advertisement clipped from the September 2 issue of *Life* Magazine where the telephone is used as the center of attraction to advertise a certain brand of whiskey. On one side in the ad's background is a refreshing looking beverage and on the other side is a silver vase from which rise four American Beauty roses. On the dial face of the instrument, four colored "digits" are visible—one rose each in place of the numerals one, two, three and four.

The advertisement, entitled "Suggestion for Inventors," reads, "What a wonderful thing a telephone like this would be! You'd just dial 'four roses' to get the most flavorful . . . you've ever tasted."

"A Good Party Line Bracelet" is a novel bit of jewelry being sold by an exclusive New York shop. A sterling silver charm bracelet, it contains as two of its attractions a nickel container "for a quick "Hello," and a tiny "'phone book" for favorite unlisted numbers — the inside of which has washable discs, the ad states, "handy if the romance wanes."

NEW SOLDERING GUN
with adjustable tip
FOR TOUGH JOBS

TIP ADVANTAGES

High heat produced in loop type tip by induction principle gives speed and flexibility to soldering with the new gun type Speed Iron. Ideal for intermittent operation for telephone installation and maintenance work.

Available at your telephone supply distributor or write direct for descriptive bulletin.

★ 115 Volt 60 Cycle 100 Watts
★ Built-In Light Weight Transformer
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★ Can't Overheat or Burn Out
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E-Z AUTOMATIC WIRE STRIPPER

STRIPS WIRE IN A JIFFY!

- Clamping the wire, cutting the insulation and stripping is automatically timed and performed with a SINGLE squeeze of the handles. Will not nick or crush stranded wire.
- A "necessary" wherever insulated wire is used.

SIZE 02 FOR 10 TO 22 GAUGE
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● To assist you in maintaining communications, power, light and gas, we design and build truck bodies on an assembly line basis—that's the business of The American Coach & Body Co.

Your needs require several different types of bodies for specific jobs . . . line construction, light line service, general service and meter installation, utility, crew compartment, maintenance, installation, tree trimming and others. We make them all.

Into these bodies, we incorporate utility, comfort, convenience, safety and appearance with one basic objective in mind . . . low cost per mile of operation.

Our policy . . . design and build the type bodies you need to maintain the high service standards of your industry at low unit cost . . . has not changed in 30-odd years.

We serve you with what you need to help you serve others.

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350 MADISON AVE., NEW YORK 17, N. Y.
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St. Louis, Mo., Buildings To Drop Switchboard Service

Owners of the Wall Building and the Metropolitan Building, St. Louis, Mo., are to discontinue switchboard service for their tenants after November 1 because of a tariff commission ruling that such service places them in the telephone business.

After the first of November tenants will be able to get telephone service only through individual lines, a spokesman for the telephone company said. He pointed out that years ago, a number of St. Louis building operators did the same thing, but that the Metropolitan and Wall owners are the only ones who have continued to give switchboard service.

Physicians, dentists and manufacturers' agents are principal tenants of the buildings.

V V

Consider Sale of Shiloh Valley, Ill., Company to Bell

Stockholders of the Shiloh Valley Telephone Co., Belleville, Ill., which has 85 subscribers in Shiloh Valley Township, met October 26 to discuss the proposed sale of the company to the Southwestern Bell Telephone Co.

Arthur Knobeloch, president of the company, and Walter Seibert, secretary, said Southwestern Bell had offered to pay $3,300.

V V

Wage Telephone Campaign On $1.00-a-Pound Butter

Housewives in Milltown, N. J., who not long ago were standing in line for butter have declared war on rising prices by conducting a telephone campaign against sales at $1.00 a pound.

One woman started the unorganized drive by telephoning neighbors October 10 urging them not to buy. "Don't buy any butter," she said. "It's $1.04 a pound today."

As the idea spread the telephone exchange reported it was "terrifically busy."

V V

OBITUARY

PAUL E. BOYCE, 39, president of the Connecticut Union of Telephone Workers, was killed October 12 in a motor car accident at North Branford, Conn., in which his wife, MRS. RUTH BOYCE was fatally injured. She died at a New Haven hospital.

Mr. Boyce had been employed by the Southern New England Telephone Co. for 17 years.

Mr. and Mrs. Boyce are survived by three daughters.

Jenkins Bros. also make Diamond Seal Friction and Rubber Tapes which meet ASTM and Federal specifications.

Most electricians know that Gold Seal sticks tighter anywhere because there's more lasting tackiness in the friction compound – more tensile strength in the fabric. Gold Seal Tape won't dry out or smear in any weather – won't ravel or peel. It's laboratory-tested at every step, and it comes to you factory-fresh, cellophane wrapped and boxed. If you don't already use Gold Seal Tape – try a roll! Jenkins Bros., Rubber Division, 80 White Street, New York 13.

JENKINS Gold Seal Tapes
FRICTION and RUBBER TAPES

MADE BY JENKINS BROS . . . MAKERS OF FAMOUS JENKINS VALVES

LEADING TELEPHONE COMPANIES STANDARDIZE ON

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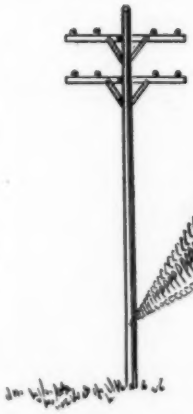

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TELEPHONE WIRES
RUBBER—PLASTIC

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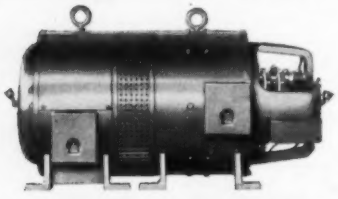

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- Control voltage well within high-low limits at all times
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X-21

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Leich Issues New Magneto Telephone Catalog

Announcement is made by Leich Sales Corp., Chicago, Ill., of a new catalog describing the complete line of Leich magneto telephones, parts and apparatus.

Featured prominently is Leich's all-bakelite magneto wall handset telephone which readily can be changed to a desk set when necessary. The compactness and modern appearance of this telephone is made possible by the use of a special Alnico generator, it is said. This generator weighs half as much and is half as big as the ordinary five-bar generator, yet it is just as powerful and efficient, the company states.

Copies of these catalogs are available from Leich Sales Corp., 427 W. Randolph St., Chicago 6, Ill.

V V

International Harvester Names Armour Research Manager

Karl O. Schreiber, vice president, manufacturing, International Harvester Co., has announced the appointment of J. W. Armour, former works manager of the company's Springfield, Ohio, motor truck plant, as assistant manager of Harvester's manufacturing research department.

At the same time, announcement was made by V. A. Guebard, manager of manufacturing of the Harvester company's motor truck division, of the appointment of A. H. Scherer, formerly general superintendent of the Fort Wayne International truck plant, as works manager at Springfield, succeeding Mr. Armour.

Mr. Guebard also announced the appointment of A. D. Bishop, former assistant general superintendent, Fort Wayne works, to the post of general superintendent at that truck factory.

Answers Rural Subscribers Who Veto Tree Trimming

As an answer to rural subscribers who refuse to permit the company to trim trees on their property in converting exchanges from magneto to common battery operation, the Jefferson (Iowa) Telephone Co., according to C. H. Daubendiek, secretary-manager, has informed such subscribers as follows:

"As you no doubt know, we had arranged to change all of the lines south of Jefferson from magneto to common battery. Line 2, the line you are on, was ready for conversion today except for the trimming of trees past your place. Employes of the company were instructed to do the trimming necessary in your territory last week, but the foreman tells me that you objected to the trimming of your trees.

"We cannot furnish you telephone service equal to the standards set by the Jefferson Telephone Co. if interference from trees is allowed to continue. Heretofore the telephone company has spent far too much money in trimming someone else's trees, a policy that must be changed radically and at once. In the future, the telephone company will take the stand that a man's trees are his responsibility and when they grow into the highway to an extent that they become a nuisance to the telephone company, the company reserves the right to refuse service. Line 2F will remain magneto service until such time as you take steps to eliminate your tree hazards to the telephone lines."

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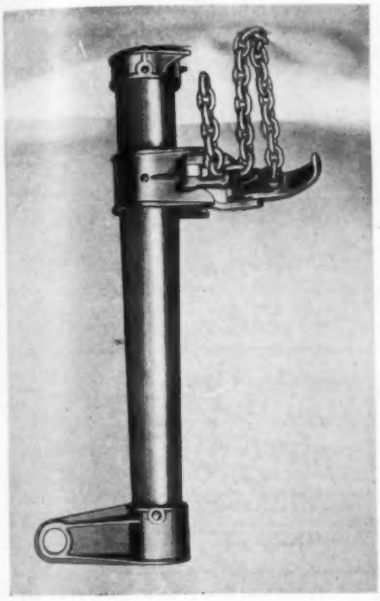
1389
NATCO
CLAY CONDUIT
The proved and standard Protection for Underground Telephone Cables.
Cheapest in the long run. Highest quality and a full line of shapes.
National Fireproofing Corp.
202 E. Ohio Street, N. S.
PITTSBURGH, PA.

A. B. Chance Develops New Pole Top Gin

A new pole top gin for hoisting telephone equipment to be mounted on poles and cross arms recently was developed by the A. B. Chance Co., Centralia, Mo. (See accompanying photograph.)



This gin may be mounted on wooden or steel poles and is held securely by a specially designed chain tightener which is locked in place with a safety latch. The hard wood mast is laminated to give exceptional strength and the heat treated aluminum castings make this light weight tool easily handled, according to the manufacturers. The gin is rated to lift 1,500 pounds maximum load.

V V

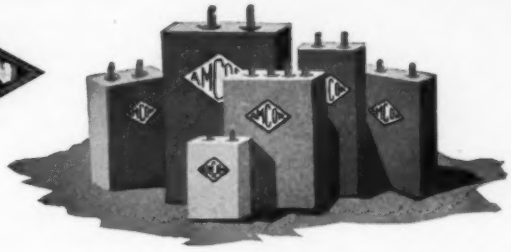
Duff-Norton Describes Jack Improvements in New Catalog

A new 40-page catalog on Duff-Norton Jacks just has been issued by the Duff-Norton Manufacturing Co., Pittsburgh, Pa. Complete descriptions, data and specifications are given for every jack in the Duff-Norton line.

Catalog 203 contains new information on Duff-Norton jacks as well as descriptions of improvements of standard jacks and new additions to the line. Described and illustrated are each of the various types of ratchet jacks, screw jacks, air motor operated jacks and hydraulic jacks. Also shown are details on the improved automatic lowering mechanism, improved journal jacks, and a new 50-ton general purpose screw jack of the inverted type.

Copies of Catalog 203 are available by writing direct to the Duff-Norton Manufacturing Co., Box 1889, Pittsburgh 30, Pa.

AMCON



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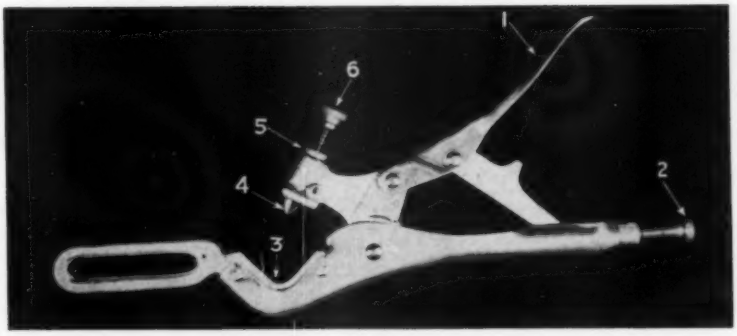

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From "Cable Maintenance" By Daniel Seitz TELEPHONY, December 8, 1945
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Engineering Library

W. J. Heacock Appointed Telex Sales Manager

W. J. Heacock, for 20 years a sales executive in the hearing aid industry, has been appointed sales manager of

W. J. HEACOCK

Telex, Inc., Minneapolis, Minn., manufacturers of the Telex high fidelity hearing aid, telemold, radio pillow speaker, and monoset—a new type of under-the-chin head set. Announcement of his appointment was made by Allen Hempel, president of Telex, Inc.

Mr. Heacock in 1931 was the originator of the direct selling plan in the hearing aid industry, which revolutionized selling methods and was adopted by all major hearing aid companies.

V V

"Gnat-Power" Indicates Force of Speech

The average power of words as they come from one's mouth is one one-thousandth of one-millionth of one horsepower, according to telephone laboratory studies recently reported by Dr. J. C. Perrine of the American Telephone & Telegraph Co.

"As power, this amount ought perhaps to be measured in gnat-power!" remarked Dr. Perrine, who made this further comparison:

If the heat power radiated from an ordinary Christmas candle could be distributed properly in minute amounts to speakers, in just the right amount for their words, 100,000 people could be kept talking continuously as long as the candle burned.

The tones of musical instruments vary widely in their horsepower. The pianissimo of a violin may be one one-thousandth of a whisper, which is about one-hundredth of the power of a normally-spoken word. The fortissimo of an orchestra may be 10,000,000 times more powerful than the violin.

These quantitative values were obtained by finding the power of the electrical facsimiles of the sounds, and not by determining the power of the sounds with human ears or other acoustical apparatus. They are used in studying ways to improve telephone and radio transmission.

FERDINAND H. RAAB, who recently was appointed industrial relations manager, Copperweld Steel Co., Glassport, Pa. (TELEPHONY, September 21, page 40.)

dependable
Cedar Poles
MICHIGAN POLE & TIE CO.
NEWBERRY—GRAND RAPIDS
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MAC GILLIS & GIBBS COMPANY
Wells Bldg., Milwaukee 2, Wis.
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Northern White and Western Red
Cedar Poles—Plain or Butt-Treated

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

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International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

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Conference Recorders
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Longtime (up to 12 hours) Conference & Telephone Recordings on Safety Film Models for Dictation "TALKIES"
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